

Willard Says.....

Pump Salesmen

Got a call from a Harry. He is a sand producer who just found out that the diesel engine that powers his eight-inch hull pump dredge is shot after only 5,000 hours of operation. He wondered if we had any ideas as to why the engine pooped out so soon.

Many years ago, shortly after Harry took delivery of this dredge, he called because it was not producing like it did while we were coaching his people at startup. We visited and found them employing the, "if a little good, more is better." rule by running the pump way too fast. We showed them how to restore the capacity rate of production by slowing the pump and maintaining the velocity around 13 fps. We heard nothing but satisfactory reports for several years.

After answering a few questions Harry revealed the twin causes of his problem—forgotten lessons and advice from a pump salesman.

Harry has a nice deposit, medium length pipeline and moderate production goals. He has a velocity meter on his dredge and said that he pumps at from 18 to 20 feet per second (fps). Asked why he was pumping at such a high velocity he said, "A pump salesman told me that I should keep the velocity at a minimum of 17 feet per second."

This is an application where production can be maintained very efficiently at a velocity of about 13 fps. Pumping at 17 fps consumes at least 40 percent more energy (fuel) than required to operate at a velocity of 13 fps.

The engine/pump speed reduction ratio on this dredge was designed for normal operation and has proven successful on many dredges. In this case, Harry had to overspeed the engine, which overloaded the engine as he strived to maintain a velocity of 18-20 fps. Engine life is directly dependent on operating speed and power output.

Harry and the pump salesman did come to one correct conclusion—the engine **was** overloaded.

Harry would have saved himself a lot of money if he had relearned the benefits of maintaining velocity at the lowest rate possible as explained in "Use A Velocity Meter".

While Harry is concerned about having to overhaul his engine, other—and probably greater—costs associated with pumping at high velocity were not so apparent:

- A. The rate of wear on a pump increases with increased velocity.
- B. Pipe wear rates, both suction and discharge, increase with velocity.

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C. Process plants have to cope with greater amounts of water.

D. Excess velocity results in decreased production because a reduced amount of vacuum is available to lift solids into the pump. High velocity “steals” vacuum in two ways:

1. Friction in the suction pipe increases with velocity so more vacuum is required to overcome this added friction.
2. Pumps develop less vacuum (Net Positive Suction Head increases) as the flow rate increases. A dredge pump that has 22 inches of available vacuum to raise solids at 13 fps may have only 18 inches available at a velocity of 18 fps.

Harry incurred significant costs because he relied on advice from a pump salesman. He had a severe case of PSV or Pump Salesman Virus. PSV is an insidious virus that steals profits. Fortunately for Harry and other victims of PSV, it can be cured and immunizations are readily available here at WillardSays.com.

There is some sentiment for declaring open season on pump salesmen or least licensing them after they demonstrate a minimum of competency. Scant evidence can be found to attest that the world would miss them if they were placed on the endangered list.

Are Our Salesmen Good or What?

Recently a pump manufacturer sent us a survey asking us to rate, among other things, their pump salesmen. Depending on what it is that they really want to know, that is actually a multi-part question.

1. Is the guy a good salesman? If the guy sells a lot of pumps, the manufacturer should not have to ask. To ask is to say that they are not selling enough pumps.
2. Is the guy a competent salesman? I know a couple salesman (and their companies) that I trust without question in terms of projecting and troubleshooting pump performance. I know a lot more pump salesmen whose competence does not extend much beyond taking the order. These folks should be restrained from offering any advice about how their products best be used.
3. Are they looking for reps that can sell pumps and then goose parts sales by convincing the customer to operate their pumps in melt mode? The pump salesman responsible for the death of Harry's engine excels in this category.
4. Can a pump salesman ride two horses at the same time? Is it possible for a salesman to represent a pump manufacturer and a dredge manufacturer at the same time? Could this arrangement constitute a conflict of interest that would be deleterious (not good for) to the interests of the pump company he represents? Would competing dredge manufacturers be so narrow-minded as to retaliate by installing other-make pumps? Would they go to such extremes just to deprive a pump/dredge salesman of any reward for his competing efforts?

5. Is the pump salesman capable of crass overselling to the extent that he would recommend that a customer install two boy pumps on a dredge when one man pump would do?

The answers to these questions are imponderable.

Block-Headed Pumping Advice

Many pump salesmen (and some pump manufacturers) are steadfast in their pigheaded insistence that 17 fps is THE velocity irrespective of other circumstances. Repeating the lie does not make it true.

Other pump people are adamant that a pump must be operated at its Best Efficiency Point (BEP) which is nearly always too fast for efficient pipeline dredge operation. The efficiency of the dredge system is of far greater importance than the efficiency of the pump.

Many pump salesmen have a mental block when it comes to velocity as illustrated by their reliance on doing a velocity spot check on a dredge that is not equipped with a velocity meter. They advise the customer to increase velocity or pronounce that things are just right, take their portable velocity meter and leave as if dredging conditions will remain constant evermore. They neglect an opportunity to impress the producer with the merits of having a velocity meter as an operating instrument. These so-called "salesmen" neglect a great opportunity to sell a velocity meter.

The inability to understand the importance of velocity and the effective use of a velocity meter is all the more puzzling when it comes to pump salesman and pump performance projections. Every projection is done with a set of system parameters at a given velocity, upon which the variables of pump speed and horsepower are determined. Some projections warn that any deviation from the pump operating parameters set forth in the projection will have catastrophic consequences in terms of performance. You can measure the pipeline ID, the pipeline length, the static lift and the pump rpm, but you CANNOT know the velocity unless you have a velocity meter or the density unless you have density meter. In dredging, all variables vary. Profits will vary as well if you do not have and use a velocity meter.

Harry is now lighter in the pockets by the cost of a premature engine overhaul because he pumped too fast, however there are many instances where a velocity of 17 fps is NOT fast enough. As a general rule (rule of thumb) the operating velocity must increase as the pipeline diameter, density and coarseness of the particles increases. It is not uncommon for a 16" pipeline to require a velocity of 20 fps or higher.

Knowledgeable operators determine the correct operating velocity for a given system by combining velocity meter readings with empirical (knowledge obtained by experiment or observation) evidence.

Curve Ahead

Some pump manufacturers have no qualms about fobbing off contrived curves on clueless customers. There are numerous pump curves floating around that are as valid as those determined by delving in chicken guts. Reliance on these bogus curves invariably results in poor results. Combine one of these curves with the opinion of a pump salesman and you frequently have the recipe for misadventure.

Through the years we have had the opportunity to work with a variety of dredge pumps and compare actual performance with the projected curve performance. We learned that there are some very good pumps that perform as projected. We also learned that some pumps are “dogs” that, with the exception of zero flow/zero speed, fail to perform per the curve.

We were involved with one of these dogs that had escaped the pound. Countless hours were spent verifying all aspects of the installation until it was clear that the pump curve did not project performance. Clear to everyone that is but the pump salesman. He would not acknowledge that the curve was wrong, that the manufacturer had misrepresented the pump’s performance and take a lesson from that.

We could only watch as the dredge owner continued to rely on the pump salesman and his bogus curve and bogus guidance regarding pump speed and power input. Ultimately it cost the owner several sets of sheaves and belts, at least two electric motors and a bunch of lost production to set things right.

Conclusion: Pump Slow! (this is critical with a hullpump)

With his engine restored to health and after a refresher course in velocity control, Harry will get along quite nicely pumping at a velocity of 12 to 13 fps. It is the profitable thing to do. It reduces wear, conserves energy, increases productive capability and enables maximum dredge system efficiency.

Moral of this story; Take pump/dredge operating advice from pump salesmen with a grain of salt. On second thought make that a bag.

Get your PSV shots!

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