

Willard Says.....

One of a series on the subject of practical hydraulic dredging.

PUMP SPEED

Dredge pump speed is a critical variable in determining the success or failure of a dredging operation. Ignorance, pump salesmen, bad pump curves and old pumpers tales have created such a fog of misinformation that many dredgers are clueless as to what speed they should run their dredge pumps.

The following short course provides useful guidance on how fast to run a dredge pump and vaporizes gobs of misinformation on the subject.

Goal

Transport solids via pipeline from underwater point A to distant point B. Water carries the solids through the pipeline in a mixture called slurry.

Velocity is the key

Slurry velocity (speed) in the pipeline must be fast enough to prevent solids from falling out of the flow and coming to rest on the bottom of the pipe. Velocity maintained at a rate faster than necessary WASTES ENERGY and may result in a LOSS of production.

The correct (not too slow, not too fast) velocity is called the TARGET velocity.

Pipeline velocity is measured and controlled through the use of a velocity meter. This fact should lead dredgers unerringly to the conclusion that a dredge MUST be equipped with a velocity meter^{1*}. The velocity indicator must be located on the operator's console.

Target velocity

Target velocity can be determined for a particular dredge system using information available in other papers on this website.

Two ways to maintain target velocity:

1. Vary pump speed using:
 - A. A manual throttle.
 - B. An automatic velocity controller.²

2. Regulate the intake of solids into the dredge system. This requires the use of three components: A. Vacuum gauge³, B. Suction bypass system⁴, C. Effective digger⁵. Two out of three is not sufficient. Success requires all three.

* Superscript numbers refer to components listed on next page.

Willard Says.....Pump Speed

Task #1

Achieve and maintain continuous, uniform production at the target velocity.

Task #2

Increase continuous, uniform production at the target velocity to the maximum rate that the system will allow.

Pump speed

Note that pump speed is not mentioned in the above recommendations. That is because THERE IS NO ONE correct, proper, set, desired or "magic" pump speed. The pump must run at whatever speed is required to cause slurry to flow through the pipe at the target velocity and NO FASTER.

Maximum production occurs when the pump is running at maximum speed WHILE MAINTAINING TARGET VELOCITY!

OR

The best rate of production for a particular dredge occurs when the pump is running at maximum speed WHILE MAINTAINING TARGET VELOCITY!

Instruments, Controls, Diggers

Contact Twinkle Co to learn more about components that will transform your dredge into an efficient, effective, profit-pumping machine.

1. Velocity meters: Doppler or magnetic models.
2. **VEECON** automatic pump speed control.
3. **LADDERVAC II** systems for ladderpump dredges.
Large, liquid-filled mechanical gauges for hullpump dredges.
4. **CONVAC S4** Suction side stability system.
5. Rotary cutter or Linear Cutter.

Comment, question, criticism, information on products mentioned? Contact willard@willardsays.com.