RL DEPPMANN

Cleveland | Detroit | Grand Rapids | Saginaw
Deppmann.com | P:800.589.6120 | F:248.354.3763

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Solving Oversized Pumping Problems

Monday Morning Minutes | by R. L. Deppmann

The last two weeks we used the Pump Affinity Laws and the Xylem Bell and Gossett System Syzer® to either trim the impeller or reduce the speed in an oversized pump. Once we solve the oversizing problem, another issue may need to be resolved.

Look at the example again. The engineer specified Xylem Bell and Gossett VSX-VSC-8X10X13.5A double suction pump in a closed chilled water system. The capacity is 3500 GPM at 140 ft head. The balancing contractor reads the pump out after a proportional balance and finds the operation point to be 4300 GPM at 120 ft. This means the pump is oversized. We reduced the speed to 1450 RPM maximum or trimmed the impeller to 10.75" to provide the correct operating point of 3500 GPM at 80 feet.

Often times in older systems and occasionally today, someone throttles the discharge valve rather than trim the impeller. It gets us back to the design condition of 3500 GPM at 140 feet and it is relatively easy to do. However, when we do this, we waste energy.

The cost implication can be unbelievable! We can use SystemWize from B&G and determine the operating cost of our trimmed impeller variable speed pump with a 20 foot control head to be about $17,000.00 per year

I used the same program to approximate the cost of a throttled discharge valve with the 60 feet across it and it added $9,000.00 to the annual operating cost!

> **"The throttled discharge valve added $9,000.00 to the annual operating cost"**

If the pump was oversized just 30 feet instead of 60 feet and the valve was throttled it would cost $4,000.00 more. What about just 10 feet: 10 feet can't be that much, right? In this variable speed application that extra 10 feet of head will cost you $1,600.00 per year.

What happens if the throttled discharge is on a constant speed pump such as a condenser water application? These numbers all become much larger. If you're in this situation, contact your Deppmann sales representative to help you determine the best solution for your system and operating costs.