National Rural Water Association
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America's Largest Utility Membership
Severing Over 26,696 Water & Wastewater Utilities

Energy Conservation Newsletter
Volume 2, Issue 9
September, 2010

Ergs, Joules & Such

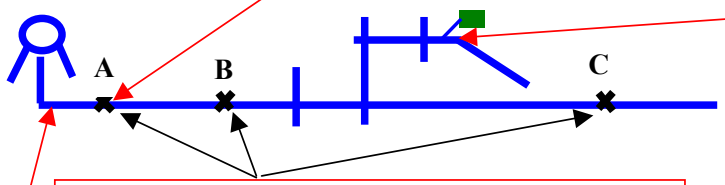
Notes On Energy Savings for the Rural Water Community and Maybe Others

One more issue of the checklist idea and then we'll get back to the regular format. By the way, for those of you in the rural water family, **we now have the newsletter on the NRWA website. Go to nrwa.org, click on links, then click on Administrative Site (password required), click on Press Room and then Ergs and Joules** .

I thought for this last checklist issue we ought to spend a little time on leak detection basics. So much energy as well as chemicals, water etc. is lost through leaks, we can't afford to ignore this source of savings. For most of you, this is old hat, but for some it may not be and a quick reminder list can be helpful, even for experts. We'll use the simple system from the December 09, issue to illustrate some basic steps. Refer to that issue for more detail.

Confused about whether you have a leak or accounting problem? Just listen to your valve wrench here with this valve slightly open late at night. (Pumps off and tank only source) If you hear significant flow, you probably have a leak(s).

Remember, you'll save a lot of time and confusion if you can work at night when use is minimal



When you have leak isolated, listen at any exposed pipe like meter connections, hydrants, etc. You'll frequently hear the leak.

Isolation is the key to leak location. Just listen at these throttled valves in sequence. When you get to a valve where you don't hear flow, the leak is between that valve and the previous one.

Finally, if you want to get the best control of your loss, consider installing a time-of-flight or saddle insert flow meter at the beginning of the system. By monitoring its flow routinely at a late hour you'll know when a leak occurs and can use the meter to isolate the leak to a section. Cost - $2000 to $5000 depending on meter.

You don't need fancy, expensive acoustic equipment for routine "leak listening". A set of these from your local drug store will work fine.

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<u>As always, contact me if you have questions about any of this.</u>

Quality On Tap!

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Energy Conservation Newsletter
Volume 2, Issue 10
October, 2010

Ergs, Joules & Such

Notes On Energy Savings for the Rural Water Community and Maybe Others

I just returned from the NRWA Annual Conference in New Orleans, and if I brought back one thing with me it was that **variable frequency drives** seem to be the wave of the future in small system energy conservation. Virtually everyone I talked to about energy mentioned these versatile devices, all in a positive way. It convinced me to spend more time on VFDs and I plan to devote this issue and the next to them. You may remember that we talked about VFDs early in the year (February and March) so some of this will be repetitive. I plan to review fundamentals in this issue and work through an actual or hypothetical case history next month. By the way, keep in mind that whatever I say about these devices is reporting what I've read – I have no personal experience with them.

- First, remember that VFDs reduce motor speed and output by changing the frequency of the electric current driving the motor. This has the advantage of matching output to demand but also reduces horsepower required dramatically.
- The horsepower reduction occurs because as speed is reduced in a centrifugal pump the horsepower required is reduced by the **cube of the speed reduction!** Energy savings are not quite that dramatic, but reductions in power bills by 50% have been reported.
- Another side benefit is improvement in power factors. Remember those nasty lines that crop up on some bills? They reflect inefficient electric consumption at your location and power suppliers penalize you by extra charges if they get too bad (low). Turns out that oversized pumps are one cause of low power factors, and if your VFD corrects that overmatching, it may also correct your low power factor.
- Don't have three-phase current at your location and want to use it because of the lower cost? A VFD can supply that for you too.
- Want soft starts on your motors? Yep! VFDs will give you that also.
- Are these VFDs too good to be true? No, there is a price, literally. They are expensive. I've seen price quotes ranging from $3000 for a 5-horse motor controller to $45,000 for a 300 horsepower installation. Wait – don't shut off your thinking because you can't afford those outlays. Maybe you can without any real net cost to your system. We're going to talk about that next issue and the following bullet gives you a hint to be thinking about.
- Next issue I thought I would take a fairly typical pump station – say something in the 100 horsepower size – see what it would cost to put in a variable frequency drive controller – estimate what that size controller would cost and how much it would save on power bills and then look at some creative financing with NRWA's loan fund and see what the bottom line might be for you. **I think you may be surprised!**
- Finally, this adapted again from Megavolt. **Electrician hands attorney $400 bill for hour's work. Attorney screams – "I never charge my clients that much!!" Electrician – "I didn't either when I was an attorney."** *Megavolt is Israeli website – obviously they haven't lost their sense of humor in midst of fighting.*

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