

## Valve Exercising

By Doug Buresh, Source Water Specialist

Along with my duties with source water protection, I've been asked to coordinate the usage of our valve exerciser machine. Thanks to donations to our equipment fund from you, our members, Nebraska Rural Water was able to purchase a new Wach valve exerciser in 2012. Why exercise valves? AWWA Publication M-44 recommends every valve should be operated through a full close and open cycle on a regular schedule to clear the operating stem and wedge guides of naturally occurring encrustation or other debris.

Ever try closing a valve that hasn't been operated in X number of years? It will most likely not close completely. Because there is not a lot of redundancy relating to gate valves in the distribution system, this means the poor sap down in the ditch trying to repair a leaking water main on the coldest day of the year is going to be miserable. And that poor, wet, miserably cold sap is often you, the operator.

We recommend all water systems have a program to routinely exercise their valves so they are in good operating order when you need them. In addition, Title 179 rules for the operation and maintenance of community and non-transient non-community public water systems require we maintain all mechanical equipment in accordance with manufacturer's recommendations. This includes gate valves.

Many systems exercise their valves by hand and that is perfectly acceptable. The main advantage of using a machine to exercise valves is the machine does the hard work. None of us are getting younger and as much as we hate to admit it, some, including me, are making our way down from the top of the hill. A hard turning valve can often be loosened up just by working the stem up and down. Again, this can be accomplished by hand, but the machine can do it much faster and not be worn out for the next valve. I've spent as long as thirty minutes exercising one valve to loosen it up so it works easier. So long as I see any progress, I'll keep at it. A six-inch valve can be completely opened and shut somewhere around thirty times in a half hour with the machine. It takes much longer to accomplish that by hand, so we can save a system valuable time. Another advantage is that our machine records an accurate turn count in tenths of a turn. This can be useful as a reference point to be sure a valve is completely shut.

Our machine is regulated by a computerized controller that goes through a protocol to exercise a valve. It limits the amount of torque applied and records the turn count. The machine is capable of exerting 750 pounds of torque. We keep it set at 150 pounds for exercising valves. I will not go any higher than that without the water operator's permission to minimize the chance of breaking the valve. To be sure the valve is cleared of any debris I like to see the same turn count on the controller three consecutive times. This usually takes ten or more rotations.

We require the water operator or other system representative sign a waiver that the system understands it is possible for damage to occur during the course of valve exercising and that the system agrees to hold NeRWA, its Board of Directors, officers, employees and representatives harmless from any and all liability relating to the valve exercising process including but not limited to damages to valves, piping, hydrants or any other equipment or property. We have broken a handful of two-inch valves and a few four-inch valves with our machine, so it can happen. The four-inchers were fairly new and we believe may have been defective. We no longer recommend using our machine to exercise two-inch valves.



I'm often asked how many valves we can exercise in a day. I've done as many as sixty and as few as twelve in a full day. It depends a great deal on the location and condition of the valves and valve boxes. We ask that a system have at least one person accompany the machine operator while exercising the valves to locate and open the valve boxes. If the box has mud, dirt or other obstructions in it, we cannot exercise the valve until it is cleaned out. If we have to wait for a valve box to get cleaned, it only takes longer to complete the job. We ask that you check your valves before our arrival to locate, open and clean, if necessary, all the valves you want us to exercise. If you can get a valve wrench on the stem, we should also be able to get ours on it. A few exceptions would be if the valve is more than seven foot deep or we are not able to park the machine within twelve feet of the valve.

A few tips for maintaining valves: Do not leave a gate valve opened all the way, unless required to keep it from leaking. It should be left one-half to one turn from the top to keep the operating stem from rusting in place. Shop-Vacs work well to remove dirt, mud or water from valve boxes. I've also seen operators use augers, clam-shell cleaners, trash pick-up tools, vacuum trucks, fire trucks and even valve wrenches to clean out valve boxes. Finally, most waterworks suppliers sell polyethylene mud plugs to keep dirt and other debris out of valve boxes. Mud plugs are inexpensive, have a handle molded into the top and can be easily cut to fit any valve box. At \$5 to \$10 apiece, they are a cheap method of keeping your problem valve boxes clean and accessible for when you need to shut a valve.

I keep a record of valve location in a notebook, right or left-hand close, number of turns, the maximum pounds of torque used on each valve and if the valve leaked while exercising it or if it had any other problem such as standing water. When we are finished with the project, you can photocopy my records or I can e-mail them to you or drop them in the mail. We do not charge our members for exercising valves, but we ask that they provide ethanol-free gasoline for the machine and make a \$7.50 per valve donation to our equipment fund.

Contact me at 402-480-4196 if you would like us to exercise your valves. As of April 14th, there are twenty-eight systems on our waiting list.