

Implementing a Valve Exercise Program

One of the tasks often left undone by water or wastewater utility operators is exercising mainline valves, including valves on fire hydrants. Regular valve exercising is an industry-standard recommendation to help maintain the valves' useful life, safety, and operation.

But it takes time and discipline to make sure that all valves are operated at least annually. This is especially true for cities or rural water districts that have only one or two operators. It takes time to exercise every valve in the water or wastewater system. The task in cities is somewhat easier to accomplish because the valves are in closer proximity than in a sprawling rural water district. But there may be hundreds of valves to turn.

Establishing a valve exercise program

A valve exercising program should be set up and completed annually by water and wastewater system. By exercising valves on a regular basis, operators can help make sure that the valves will operate when they're needed for a repair on that section of line, to shut off water to a delinquent customer or to turn off the water to a broken line. Not being able to shut down a section of pipe only hinders the repairs. In some cases, when Kansas Rural Water Association staff have been trying to help water systems, we find it's only the valve at the storage tank that operates. That means that to repair a 4-inch pipe anywhere in town, the entire system likely loses pressure which can result in the system needing to impose a boil water advisory.

Water and wastewater systems should establish and follow a regular valve exercising program. Any problems noted during the program should be documented and timely repairs should be made. It's critical to have operable valves that can isolate sections of the system.

KRWA recently acquired a valve exercising trailer to help cities and rural water districts that want help in

exercising their valves. KRWA staff have been extremely successful in restoring many valves thought to be irreparable back to full function. KRWA's valve exerciser trailer also has a vacuum and power washer to clean out the valve riser boxes or meter pits that have filled with dirt.

As one example of the use of the valve exerciser, in December 2020 and



This valve box was filled with dirt, preventing a valve wrench from accessing the operating nut.



KRWA Circuit Rider Greg Metz and Onaga Superintendent Lynn Krohn use the power washer and vacuum to remove the debris from a valve riser.



The vacuum does a very good job of removing debris. The valve can now be accessed. Note the locator wire does not go to the bottom of the riser. The wire was placed on the outside of the riser and then inserted near the top through a small hole. This protects the wire when operating the valve.

January 2021, KRWA assisted the city of Onaga in Pottawatomie with exercising their mainline valves. KRWA Circuit Rider Greg Metz had already helped with operating ninety

Valve Exercising Program Guidance

The American Waterworks Association (AWWA) provides guidance in AWWA Manual M44 as well as suggesting manufacturers' recommendations for valve exercising procedures. The guidance suggests the program includes at least the following elements:

- 1) A goal for the number of transmission valves to be exercised annually based on the percentage of the total valves in the system.
- 2) A goal for the number of distribution valves to be exercised annually.
- 3) A goal that 100% of the valves are tested within a certain time frame.
- 4) Measures to verify that the goals are met and written procedures for action if the goals are not attained.
- 5) Critical valves in the distribution system shall be identified for exercising on a regular basis. Potential water quality and isolation concerns shall be recognized. The program shall track the annual results and set goals to reduce the percent of inoperable valves.
- 6) The valve-exercising program may be implemented in conjunction with the systematic flushing program.
- 7) A goal of replacing the inoperable valves identified during the operation and maintenance process shall be established as part of the exercising program.

Determining which valves are critical

- Transmission mains affecting service to large groups of customers
- Distribution valves necessary to maintain service to critical customers such as: hospitals, dialysis centers, nursing homes, medical facilities, manufacturing facilities, downtown/high density areas, and service connections where loss of flow could impact human health due to catastrophic events (Waste water treatment plant critical processes or loss of cooling water to processes where it is critical)
- Areas prone to main breaks
- Areas of infrastructure approaching the end of its useful life
- Areas around road or other utility re-construction areas

Frequency of exercising

- Critical valves - annually
- Non-critical valves:
 - Rate of deterioration known to occur in the distribution system. Systems should operate a representative sample annually to determine rate of deterioration
 - Consequence of failure or delays in being able to close the valve



Onaga Superintendent Lynn Krohn and Operator Rick Glessner use the valve exerciser to operate the valve. With the type of valve used in this system, each 6-inch valve required 23 turns to fully close.

(90) valves on the mainline and the fire hydrants on the east side of town. Another sixty-six (66) valves were exercised on January 12. Many of the valve boxes had dirt in them that prevented a valve wrench from accessing the nut. In one case, a valve riser had tilted and was nearly at a 45-degree angle. The valve was on a fire line to a building. A valve wrench would not access the operating nut. Normally to fix such a problem would require excavating around the valve

around the riser. This required only about ten minutes. And there was very little disturbance to the house yard where the valve riser was located.

To be efficient, system operators should have the valve located and be accessible before KRWA arrives with

the exercise / vac trailer. KRWA charges a nominal fee of \$25 per hour for the exerciser. If you are interested in having KRWA assist with exercising call the KRWA office at 785-336-3760 or Greg Metz at 785-541-0342 to discuss the work.

riser by hand or by using a backhoe. That process may take two hours. But with the valve exercise machine on site, the city operators removed the sod from around the riser and then using the power washer and vacuum from the KRWA trailer, the dirt was removed from the backside of the riser, the riser was then straightened and backfill was compacted

Greg Duryea started work for KRWA in 1993 as Technical Assistant. He holds a Class I water certification and is the certified operator for Sycamore Springs Resort in Brown County. Greg announced semi-retirement from KRWA effective January 15, 2021.



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