By Tony Kimmi, KRWA Tech Assistant

Operable Valves Are Essential to Every Water System

This mainline valve assembly is located in Pompano Beach, Florida.

KRWA Tech Tony Kimmi works to reach the level of the pipeline and valve in a small town in northeast Kansas.

Valves are a vital part of a water system. They allow the shutdown of water mains – assuming that the valves are operable.

However, without attention or maintenance for an extended time, they can significantly contribute to what often becomes an intense and serious issue, especially during a distribution system break. A valve exercise program that is properly implemented helps ensure that valve problems will be reduced. It's been explained at training sessions, discussed among utility staff, and written about in various publications. But for all the good intentions, exercising waterline valves always seems to be one of those work items that is ignored or next to lowest on the listing of priorities. The Kansas Department of Health and Environment has made "valve exercising" an item on the scorecard of the inspections of water systems.

Research studies show that the national average of valve operability (or useability) is about sixty percent. Wow! This means that less than two-thirds of the waterline valves operate! To help ensure that valves operate when needed, they should be exercised annually according to KDHE's requirements.

An operator must fully close a valve by using a valve wrench to turn the stem to an off position to exercise a valve properly. (There are right and left-handed valves in different systems.) After the valve has been fully closed, use the valve wrench to turn the stem in the opposite direction and open the valve fully. Many water technicians have suggested, myself included, to exercise the valve a minimum of three times. Exercising the valve multiple times will help the operator to evaluate that the valve if is working correctly. Operable valves save time and money and limit the number of service outages in the event of a water leak or an emergency vs. just having a service outage in a small area.

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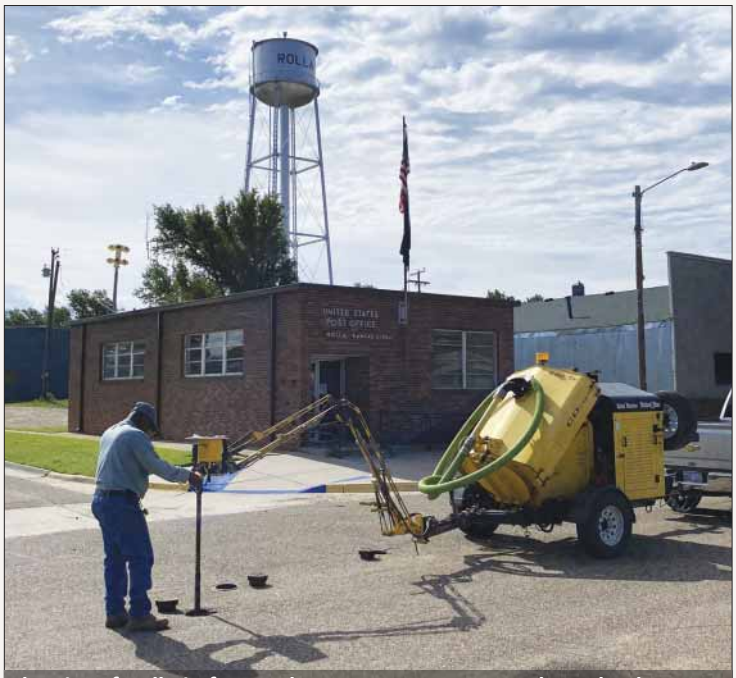
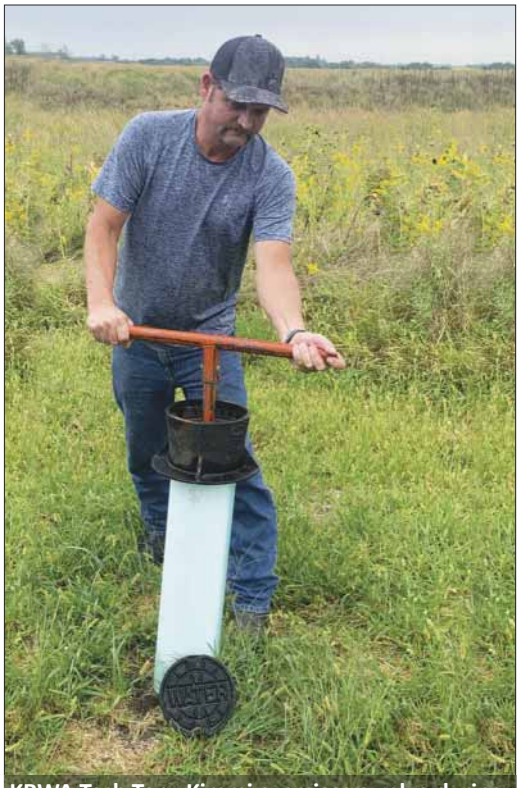
KRWA provides valve exercising service . . .

Because most rural water districts and small and medium-sized cities have no way other than to manually exercise valves, KRWA began providing a service of exercising valves. KRWA has a hydraulic machine to turn valves. The unit also has a vacuum that can easily clean out risers (also referred to as boxes) that often are filled with dirt or rocks. Unfortunately, many times valve boxes in cities have been asphalted over. I recently worked in a small town that had installed a new water system about twelve years ago. There, the valves were covered with four to six inches of asphalt. KRWA helped locate the valves; the city's water operator placed an extension on the valve box and poured a square of concrete around each valve. Accurate maps, whether on paper or digital, are essential when locating valves that an operator cannot find. In those situations, I use a metal detector to locate the metal top on the valve riser. In some cases, KRWA staff remain onsite, but in others, the valve-vac is left with the city.



The city of Rolla in far southwestern Kansas recently took advantage of the KRWA valve exerciser and vacuum. Operator Troy Cooper is shown exercising a valve/ KRWA charges $25 per hour for the use of the machine and to cover fuel costs. A total of 52 valves were exercised. Several valve boxes had to be located and uncovered.



KRWA Tech Tony Kimmi exercises a valve during a water loss survey on a rural system in northeast Kansas. Notice the tilt of the valve riser. This is due to a lack of adequate compaction around the riser or it was not straight and centered at the time of installation.

If a valve is not working properly, the city or rural water district crew members need to move to a valve further upstream on the waterline to evaluate the effectiveness of another valve. If valves are not exercised regularly, finding the valve that is not operable can be costly in time and water loss. If there is an issue with the valves, it needs to be assessed one valve at a time leading backward in the distribution system. This results in additional time and labor searching for the issue, and more importantly, more water customers potentially being without water for an extended time. If numerous customers have to go without water or a water pressure falls below 20 psi could lead to a boil order being issued.

Another asset of a valve exercise program is ensuring that valve risers (boxes) are free of debris such as dirt, rocks, etc. Valves must be accessible and operable in the event of an emergency. The Kansas Department of Health and Environment may issue a boil water advisory when system pressure drops below 20 psi.

In warmer climates in the far southern United States, valves are often above ground. This is because there is little threat of freezing. There are also several advantages of this practice. The valves are easily identified. There is no need for debris removal from the valve riser, and it also provides easy access to exercise the valves on a routine basis. It also makes it easy to quickly identify if a valve has not been seated correctly or does have a leak vs. looking down a valve box to attempt to identify a potential problem.

Tony Kimmi has worked as a Tech Assistance for KRWA since October 2009. He has extensive experience in the operation of construction equipment. He has assisted in the construction of several rechlorination stations and ongoing monitoring of water quality issues. Tony enjoys providing assistance to public water systems.