

# Failure of the Main Valve

## at the Tank Means Big Time Trouble



**A** small town in northwestern Kansas recently called and requested assistance because they had little or no chlorine residual. Within thirty minutes of trouble-shooting, it was discovered that the chlorine injector had plugged; cleaning would be required. In order to begin cleaning this valve, we found that the isolation valve in the well house also contained a large amount of mineral deposits and needed to be replaced. Further investigation revealed that the main valve isolating the well from the distribution system was not functional, either.

Working with the system operators, I determined that the only options to make the necessary repairs and to prevent damage to the well house controls with a heavy spray of water was to either shut off the water tower or drain it. After notification was given to the businesses and residences, the water tower valve was closed. However, this valve would not completely close – but seemed to shut down to about 95 percent of the flow. We opened a fire hydrant to reduce pressure while the valve in the well was

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replaced and the chlorinator repairs were made. It only required about fifteen minutes; pressure was quickly restored.

After the repairs were completed, I discussed the water system deficiencies with the city officials. I told them it is in their interests to correct the problems: 1) inoperable valves; 2) no maps; 3) inadequate inventory of spare parts; and, 4) support the new operator who is trying – but needs help. It's reassuring to know that they plan to address those issues.

### **Leaking main valve adds days of labor costs**

On the same day, another small town operator called to report the mainline valve at their storage tower had a leak in the packing around the valve stem. This has been a problem before and I have assisted the city with the same issue. Because the tower was erected in 1919, we assume the valve is the same age. In the past we discussed the problem of having to isolate the tank to make any system repair. In 2009 when the tower maintenance crew scheduled welding repairs on the tank, the flow could not be completely shut



The superintendent of this small town water system makes cuts to remove an old leaking valve at the base of the city's water storage tank.

and exercised; both seemed to operate reasonably well. The day we started the project, a pressure relief valve was placed on a fire hydrant used during the previous tower repairs. The system would operate on direct well pressure. While removing one of the two valves to isolate the tower, the valve stem broke in the "Off" position; we were back to the drawing board.

Water sensitive residences and businesses were notified there would be a total loss of pressure. The school asked if we could postpone this project. That obviously was not an option; there was no turning around at this point. KDHE was notified that this small system would be below required operating pressure of 20 psi. Public announcements were made concerning the repairs. We excavated the valve and took measurements to prepare for the replacement.

To complete the repairs, we began by measuring two cut sites, before and after the old valve. We

down. It was necessary to shut off service to large sections of the town so that the repairs could be completed. Because valves would not fully close, the repairs that should normally have required one day ended up taking almost three days instead. After the operator explained the problems with valve operation to the city council, a new 8-inch valve with resilient seat and components was added to the budget and ordered. That was progress. I volunteered to help make the installation.

A week before the valve was to be installed, Kansas One Call was notified; all other utilities in the vicinity of the tower valve were located and identified. The two valves that further isolate this valve from the system were located

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inserted an 8-inch cast iron stub piece with restrainer glands in the new valve; this would be three to four inches shorter than the planned cut sites on the old valve. The operator had shut the well controls down the day before to drop the tower level to reduce water waste. Two fire hydrants were opened. In about thirty minutes, the tower

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**Diane Patton** [dpatton@waterwiseenterprises.com](mailto:dpatton@waterwiseenterprises.com)



The 1919-era valve is lifted out to make way for a new resilient seat valve.

was drained. We began cutting out the old valve at about 1:15 p.m. After the cuts were made, the old valve was removed with a backhoe and chain. The new valve was lowered into place after being swabbed with Clorox. Another restrainer gland tied the new valve to the tower side and a High Max coupler tied the stud end to the system side. This required about thirty minutes to complete, after which we began to restore pressure to the system. At 3:00 p.m. I informed the KDHE district office that pressure was almost 30 psi, and rising. By 4:00 p.m. the system was back to normal with most of the air flushed out of the mains.

This spring the city is planning to replace the valve that broke in the “Off” position to restore the loop of the

distribution system to the tower. Because of its location, the system will have to pressure down again to make this repair.

While the replacement of strategically located mainline valves may seem routine for larger cities, about the last thing anyone in a small town wants to do is cut into the main water line that supplies the water storage tank. Many communities have neglected valve maintenance; the valve at the tank is often the only operable valve. But in the two systems I referred to in this article, the main tank valve were inoperable.

I hope that readers will plan to attend the 2010 conference and exhibition in Wichita on March 30 – April 1. I hope that operators and board and council members together will attend training sessions, view the exhibits and make

new friends. There’s always a wealth of information and a myriad of products and services available for review. Go with the idea of addressing the problems and deficiencies that your city or RWD may have; there are many people who will be willing to help get those addressed.

*Doug Guenther has worked as Technical Assistant for KRWA for 11 years. Doug worked for the City of Oakley in the Water and Electric Department for 8 years. He has also worked several years for an industry supplier. He is a Class II Certified Water Operator.*



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