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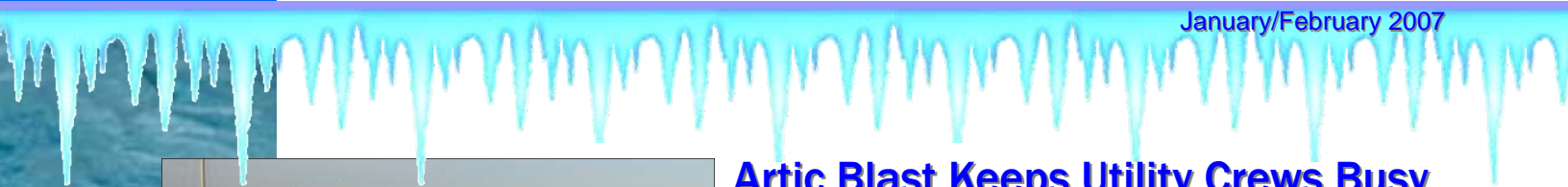
# UTILI



# GRAM

*"Providing and Protecting Kenosha's Greatest Natural Resource...Water"*

January/February 2007



## Artic Blast Keeps Utility Crews Busy

A sudden blast of cold air out of the North has had a dramatic effect on the workload at the Water Utility. During the months of December and January, we had experienced a relative mild winter, with temperatures ranging far above the normal for that time of year. However in February, Mother Nature reversed course and temperatures plummeted to well below the average. In fact, this February may go on record as one of coldest Februarys ever recorded. So you might be wondering just how these cold temperatures effect the workload at the Water Utility.

With temperatures well below the freezing mark and a bone-chilling wind that drives the wind chill temperature even lower, frost begins to penetrate deeper and deeper into the ground. This causes an expansion and upheaval of the ground, which is known as frost heave. As the frost permeates deeper into the ground, the soil surrounding water mains begins to shift. This in turn introduces stresses on the water mains that can cause them to rupture. The older the water main, the more vulnerable it is to this kind of failure. Freezing of water mains is not normally an issue during cold weather, because the mains are installed well below the depth that the frost is expected to penetrate during most winters.

At the beginning of the year, the Water Utility was well below the average for the total number of water main breaks for the year; however during the recent cold spell the Utility has quickly made up for lost ground. Unfortunately for Water Distribution crewmembers, the water main breaks must be repaired in the most arduous of conditions. It is not uncommon during an extreme cold spell for the Utility to have several main breaks occurring at the same time. While one crew works to pinpoint locations of breaks and attempt to throttle back the flow of water whenever possible, the two remaining crews leapfrog from one repair to another. This means long hours spent each day performing backbreaking work. While some of us might complain about being stuck in the office during a nice-weather day, I don't think any of us would complain too loudly during the cold winter months. Our hearts really go out to the Water Distribution crews as they work diligently to keep water flowing throughout the City.

Speaking of keeping water flowing, the Water Utility receives numerous calls from customers complaining of frozen services as temperatures begin to plummet. This keeps the Meter Shop crew extremely busy thawing services up to the point of the water meter. Pipes frozen beyond the point of the water meter are the responsibility of the customer to thaw. Additionally, operators at the Water Production Plant must do everything possible during extreme cold weather to keep water flowing through the intakes from Lake Michigan as well as prevent water from freezing in the elevated storage tanks. This has been especially challenging for the operators during the recent cold spell. Likewise, the extreme cold weather causes operators at the Wastewater Treatment Plant to have similar concerns as they work to keep settling basins and tanks from freezing. All in all this is a very busy time of year for the Water Utility as we all work to keep the water and wastewater flowing in proper directions and to keep our customers satisfied.

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## Water Production Plant Briefly Taken Offline for Minor Repairs

In December of last year, the Water Production Plant had to be taken offline for a few hours while repairs were made to the large chemical feed pipe that supplies



Chemical Feed Pipe Before Repair

finished water to the water distribution system. Due to the configuration of plant piping, there was no other way to effect these repairs without having to completely isolate the plant from the rest of the distribution system. It is a well-known fact at the Water Utility that there is sufficient water stored in tanks dispersed throughout the distribution system to satisfy the City's water needs for several hours without supplying a single drop of water from the Production Plant. Nevertheless, isolating the plant from the distribution system causes plant operators and managers alike to feel a little bit uneasy.

In order to guarantee success, several things had to be taken into consideration in planning for this repair work. First, this work would have to be performed during a time period when the demand for water is low. This meant that this work should not be performed during summer



Chemical Feed Pipe After Repair

months when water demand is at its highest. Furthermore, the work should be performed in the late evening to early morning hours when there is virtually no water usage throughout the City. An even bigger concern to the Water Utility was whether or not there would be enough water available at sufficient pressures to extinguish any fires that might occur in the City while the plant was isolated from the distribution system. This was confirmed by all of the technical data available; however the Utility needed to be absolutely sure. To this end, a

practice session was held in the late summer of last year. During this session, the plant was isolated from the distribution system, allowing water to be supplied to the City solely from the water storage tanks. During this time, tank levels and pressures at key points in the distribution system were monitored to ensure the system was functioning according to design. Once satisfied with the performance of the system, final arrangements were made to have a contractor make the repairs.

To make these repairs, the flanges for two of the chemical feeds had to be completely cut off from the main water feed pipe and new flanges welded into place. Once the flanges were cut off, there would be no turning back. Therefore everything had to be ready to go, including having the new flanges pre-fabricated and test-fitted to the pipe. Being completely satisfied that everything was ready to go, a date was scheduled with the contractor to perform the repairs. On the day of the repairs, plant operators made sure that all of the storage tanks were topped off with water. At approximately 9:00 p.m. the main valve was closed to isolate the feeder pipe from the system and another valve was opened to allow water to drain from inside the feeder pipe. As practiced once before, the Utility began monitoring tank levels and pressure gauges to ensure that the system was operating according to plan. The contractor arrived at approximately 11:00 p.m. and within two hours, the repairs had been made. This may seem like a lot to go through for a two-hour repair; however when it comes to water, you can never be too careful. Added benefits to this operation was training of the Water Utility staff and the assurance that the system can be operated in this manner.

## Utility Receives Homeland Security Grant from the Office of Justice Assistance

In November of last year, the Water Utility scrambled to pull together all the information necessary to prepare and submit the grant application before the deadline expired for the FY'05 Homeland Security/Critical Infrastructure Grant. The application had to be filed with the State of Wisconsin, Office of Justice Assistance before December 8th of 2006. With the help of

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the Kenosha County, Division of Emergency Management, all the information was gathered and submitted in the nick of time. This was a lot of work in a very short period of time, but the Utility's efforts soon paid off. In January, the Utility was notified the it had received a security grant in the amount of \$119, 255. Thinking that the Utility might only receive between \$10,000 and \$15, 000 in grant money, if at all, we were overjoyed with this amount. This will go a long way in improving security of Water Utility infrastructure.

The Utility has been proactive in taking steps necessary to increase the security of its infrastructure. After completing a vulnerability assessment, the Utility contracted to install a sophisticated intrusion detection and access control system. This system was installed at the Water Centre, Production Plant and the Wastewater Treatment Plant. It includes a variety of surveillance cameras and intrusion detection equipment as well as numerous access control devices installed to control and monitor access to certain doors. With the final items being completed, this system is now operational at all the above-mentioned facilities.

With the grant monies received, the Utility will further expand this system to include surveillance monitoring at each of our water storage/pumping facilities, as well as to add additional cameras at the Water Production Plant. When it comes to protection of our greatest natural resource—water and the employees that work to deliver it to customers, you can never be too safe.

## SCADA System at the Water Production Plant Receives Badly Needed Upgrade

The SCADA system, which stands for Supervisory Control and Data Acquisition System, recently, received a badly needed upgrade at the Water Production Plant. This type of system is very complex and is employed both at the Production Plant and the Wastewater Treatment Plant. Its purpose it to remotely monitor key pieces of equipment and report their status back to a central location. Operators can then keep track of this information on a system-wide basis and take appropriate actions to keep plant processes working at an optimal level. The system also allows certain pieces of equipment to be operated from a remote location, such as the opening and closing of valves. Without this system, it would take numerous employees to accomplish the same feat. Instead, a single operator at each plant can do the work of many with this system.

The Water Utility contracted with the engineering consulting firm of Reukert-Mielke located in Waukesha, Wisconsin to perform this upgrade, since one of their divisions is very

experienced in performing this kind of work. It has taken Reukert-Mielke more than a year to collect all the necessary data, complete the necessary computer programming and install the new equipment. The biggest challenge has been to replicate all of the functions and reporting abilities of the existing system. There is no margin for error, as even one minor glitch in the program could cause the entire Water Production Plant to shut down. To overcome this dilemma, the new system was installed in parallel with the existing system. As programmers and operators observed that the new system was operating correctly, then one-by-one transfers were made from the old system to the new system.

The upgrade includes the installation of a new data server and several new workstations, including all the necessary software licenses to make the system work. Some of the workstations, mainly those being installed in the control room, received a double monitor, allowing the operators to view more than one computer screen at a time. So far, the transition to the new system has been seamless. Its increased reliability has made operating the plant a little less stressful for the plant operators. Even the Plant Superintendent, is getting more sleep at night.



New Data Server with Retractable Monitor and Keyboard



New Workstation with Double Monitor Installed