by Jon Steele

Are you ready for the next big storm or emergency?

As a young boy attending Boy Scouts, I learned that the Scout motto was "Be Prepared." This helped shape my thinking while growing up and as an adult I have always remembered that motto. This past year has taught many Kansans that while it's good to try to be ready for anything, no one can outguess the weather. As other articles in this magazine point out, 2007 was an extraordinary year for severe weather in Kansas. I would like to expand on what it meant to be prepared in relation to the December 2007 ice storm.

Every water utility in Kansas is required to develop an Emergency Water Supply Plan (EWSP). This plan must be submitted to the Kansas Department of Health & Environment (KDHE) for approval. This is not supposed to be a "fill in the blanks document." Each system is unique and smaller cities and RWDs will not have the same issues as large water utilities.

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Each EWSP gives a description of the system, disaster organization, an inventory of owned equipment, other locally owned equipment and other available resources. System personnel should have some understanding of how vulnerable the utility is depending on the type of disasters they have experienced. The most frequent would be power outages, main breaks, fires, flooding or damage from storms. The EWSP also outlines who is in charge and lists emergency contact information.

Why not be prepared?

During the recent ice storm there were power outages over a large portion of Kansas; it left tens of thousands of people without electricity and many without phone service. Many public water systems did not have generators available to produce power to produce or pump water. There were systems without power to run wells or treatment plants for several days. If all the water from the storage facility was used, then a 'Boil Water Advisory' was issued when the power was returned to service. Additional bacteriological samples were required and only when tests were negative for bacteria were the boil advisories removed. County emergency preparedness coordinators, KDHE, Kansas Municipal Utilities and KRWA assisted systems to obtain generators.

No one can prevent weather-related disasters, but there are some things systems can do to be better be prepared. Each water system should have computer records backed up and stored in a different location. Copies of critical information on the systems should also be stored elsewhere. These include maps, pump records, reports, compliance reports and other business information.

Above: *Water docks like the one pictured here were essential for stock watering and for those families with a storage tank but no power to operate well pumps.*

Left: *Sylvia, Kansas rented this large industrial generator to produce water during the December ice storm.*

In the case of a widespread power outage, having enough fuel on hand to run generators or emergency vehicles is also important. I witnessed people siphoning fuel from non-essential vehicles to run generators. At a minimum, all vehicles and any extra fuel cans should be filled before power is lost. There was ample warning in December to know that an ice storm was likely, if not imminent. Other items to have available include flashlights, batteries, propane bottles, and portable heaters. However, making sure of the presence of adequate ventilation is always a concern when using these heaters.

Local county emergency management agents did a good job of finding and delivering generators for water systems. Basically they needed to know the size and phase of the generator needed for a particular application.

Sizing, safety – primary concerns

Generators are rated in watts for smaller units and kilowatts in the large industrial units. Care must be taken when connecting a 3-phase generator to the electrical system. While the motors may be 3-phase, typically the rest of the treatment units are single phase, 120V AC. Severe damage will result if a generator is connected incorrectly to the single phase portion of the electrical system.

Using proper testing equipment when connecting generators to the electrical system can save thousands of dollars in damage. Also having knowledgeable people make these connections is well worth the price. Having to replace feed pumps or booster pumps is costly and time consuming.

After the generator is wired in and the pump motors are running in the right direction, a voltage check should be completed. Most large generators can be adjusted to achieve the desired voltage. One unit I saw had a dial that could be adjusted to increase the voltage from 208 to 220 or more if needed.

Keep in mind that generators need to be sized for the demand that will be placed on them. The starting load on the unit is usually much greater than the normal operating demand. Having too small a unit has the potential of destroying pumps and motors and even the generator being used. Having soft starts or variable speed drives will help reduce the starting demand when the pumps are turned on. Also pay close attention to the manufacturer's operational manual. If it says to change oil every 25 hours of operation, then do that! This is a small price to pay when the need for the generator is critical. KRWA will try to address these topics in future training sessions and technical articles.

When the ice storm hit Lyons, Kansas, the city was able to operate one well from a standby unit. By the end of the week the water storage facilities were nearly empty. The power company could not estimate when power would be restored. I was able to borrow a trailer-mounted generator from a neighboring city to operate another one of the Lyons wells. Kansas

Above: *A tractor's power take-off or PTO drive is used to run a generator to power one of the Abbeyville, Kan. sewer lift stations.*

Right: *A tractor PTO coupled to an Abbeyville well's right angle drive powers the well pump.*

Dept. of Emergency Management had located a large generator, but it was delayed due to a snowstorm that hampered travel. As it turned out the generator from the nearby town was large enough in amperage to operate the 100 hp motor, but it would not produce the 440 volts needed. We ended up using it to operate the sewer lift stations instead. Each lift station had to be hard wired in since there were no plug adapters or double throw switches. That became a real challenge since it was dark, cold and in the middle of a substantial snowstorm at times producing white-out conditions.

Equipment such as sewer lift stations that may need to be operated during a power outage should have permanent connectors on the box with a double throw switch that allows for easy switching to the alternate power supply. If the system owns a permanent mounted generator all that is needed is the double throw disconnect switch.

When dealing with widespread power outages, the most important thing to keep in mind is safety. The concern for many power companies that worked countless man-hours restoring power was that the generators did not feed back onto the lines they were working on. Having knowledgeable people connecting the generators can save time, equipment and even prevent injury or loss of life.

In closing, I also want encourage attendance at the 2008 KRWA Conference March 25 - 27 at Century II in Wichita. There are several sessions on emergency preparedness and the development of a statewide mutual aid program that deserve attention of all systems.