FAREWELL TO THE PROCRASTINATORS (NO PUN INTENDED)

John Farewell | State Circuit Rider II

It was 1:00 in the morning when Dr. Carlisle received the call. A 17 year old girl was just admitted to the emergency room, a victim of a single vehicle accident. Unable to slow the car at a dangerous curve, she crashed head on into a tree. Her condition was grim and her only chance of survival depended on him. He immediately rose from his bed and began his 30 minute drive to the hospital. Fifteen minutes later the girl's father received the call that no parent ever wants to receive. The news hit him hard as he thought to himself, *why didn't I get those brakes fixed?* He knew they were bad but money was tight at the moment. He had planned on making the repairs the following week. *Why did I even let her take the car?* He too headed out the door and began his 15 minute ride to the hospital, a trip that would seem to take forever. He was only a few miles from the hospital when his car came to a sudden stop, leaving him stranded alongside the road. Several attempts to restart the vehicle failed. He opened the door and started running down the road towards the hospital, thinking only of his daughter. Moments later, he spotted a set of headlights coming up behind him. Half crazed, he flagged the vehicle down, opened the driver's door and pulled the operator from the vehicle. He then climbed in and sped off towards the hospital, all the while yelling how sorry he was and that he would return the car as soon as possible. His heart sank as he entered his daughter's room. This beautiful young girl that he had raised from birth now lay clinging to life. The hospital staff was doing everything they could. Where was Dr. Carlisle?, time was running out. The girl couldn't hold on any longer and finally gave up the fight. Time of death was 1:45 am. The father was overwhelmed as regret and grief filled his soul. It was 2:00 am when Dr. Carlisle walked through the door. He looked exhausted and was out of breath. The hospital staff informed him of the news and asked what took him so long. He informed them that some crazed man had dragged him from his vehicle and sped off leaving him stranded. He had to run the last few miles only to find out it was too late.

This may seem like a dramatic way to lead into the subject of this article, however please read on. Maybe before you're done you will change your mind. The subject, Cross Connection Control, you know, those dreaded backflow preventers that are out there protecting your water system. Many of you have forgotten about them or worse yet, they don't even exist in your systems. Judging by the look of this picture, this backflow preventer has long since

been forgotten about. Found in a meter pit feeding a Mobile Home Park, it now lays half covered with dirt and totally useless. A good Cross Connection Control Program is essential, and required, to any water system. Why you ask? Well let's ask the residence of Lacey's Chapel, Alabama. On Wednesday, October 8, 1986, an 8" water main of the Bessemer Water Service broke. While repairing the main, one of the workers suffered leg burns from an unidentified chemical. Later on that day, residents in the area began to complain of burns in their mouths and throats as well as tiny red blisters on their skin. Many of them required medical attention. At 7:00 am Thursday morning, the Bessemer Water Service shut down water to that area. After an investigation, it was determined that when the water main broke on Wednesday morning, a truck driver at a nearby chemical plant was adding water to his tanker truck that had carried sodium hydroxide. On this occasion, the driver was filling the tanker from a connection at the bottom of the tank. Consequently, the sodium hydroxide in the tanker back siphoned into the public water system, due to lack of pressure created while repairs were being made on the water main. Approximately 60 homes in the area were contaminated. Measurements of pH levels were as high as 13 in some homes. There were no backflow preventers at the water service connection to the chemical feed plant. The Bessemer Water Service did not have a Cross Connection Control Program despite State regulations which required it. *(If you would like to see more case histories of cross connection incidences simply Google: Summary of Backflow Incidents-No Backflows. There you will see a list of 35 more examples like this one)*

Though cases like these are few and far between, Murphy's Law dictates that if it can happen it will, it's just a matter of >>>

time. I myself once created a situation like this. I was installing a fire hydrant outside of the well house at the village water system where I was Chief Operator. I had turned the power off to the pumps and isolated the water main in this section. After I had completed the hydrant installation, I went back in the well house to start the pumps back up. I noticed that the 100 gallon chlorine solution tank was empty. I knew that I had filled it that morning, yet it was now empty. By relieving the pressure on the main to install the hydrant, it created a siphon effect on the chemical feed pump hooked to the solution tank. The check valves in the line were pressure activated and without any pressure on them, it allowed the chlorine solution to get sucked down into the main. Fortunately for me, I happened to notice the empty solution tank before I turned the pumps back on and sent 100 gallons of super chlorinated solution out into the distribution system. A simple flushing took care of the problem and a valuable lesson was learned. With this in mind, we must, and are required, to protect our water systems from these kinds of disasters. *(See Part 5 NYS Sanitary Code, subpart 5-1.31)*

In 1981, the New York State Department of Health's Bureau of Public Water Supply, issued a Public Water Supply Guide to Cross Connection Control. *(A PDF version can be viewed by Googling: Cross Connection Control Manual Cayuga County)* Though I will not bore you with all the details contained in this guide, I would like to highlight some. Having a Cross Connection Control Program in place is the first step. Hopefully you have already done this but if not, now is a good time to start. Print a copy of the manual and start looking through it. We here at NYRWA, would be glad to help. There are 3 different degrees of hazards outlined in the manual. They are:

Hazardous Facilities: ones in which substances may be present which if introduced into the public water system would or may endanger or have adverse effect on the health of other water customers. Such as laboratories, sewage treatment plants, chemical plants, hospitals and mortuaries.

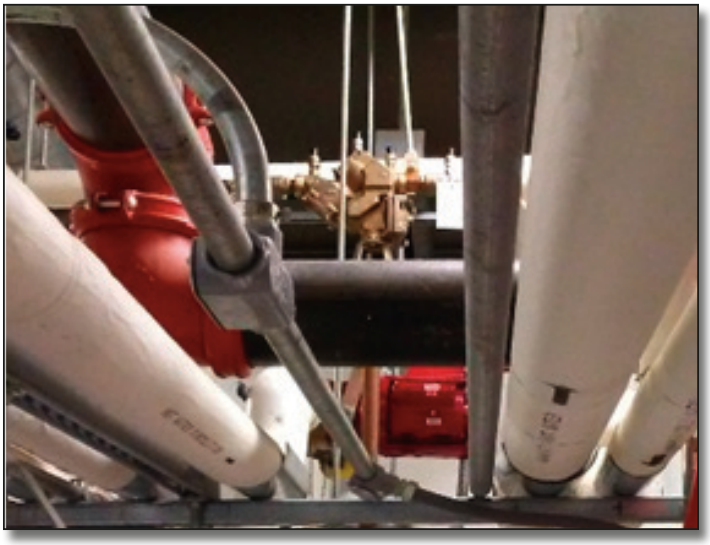
Aesthetically Objectionable Facilities: ones in which substances are present, which if introduced into the public water system, could be a nuisance to other water customers, but would not adversely affect human health. Such as hot water, stagnant water from fire systems with no chemical additives.

Non Hazardous Facilities: ones which do not require the installation of an acceptable backflow prevention device.

Proper selection of an acceptable backflow prevention device will depend upon the degree of hazard. For the purpose of this article, I am only going to discuss two types of devices. They are a Reduced Pressure Zone Assembly (RPZ) and a Double Check Valve Assembly (DCV). For hazardous facilities, a RPZ would be required. The advantage of a properly installed and working RPZ is that it has a relief valve that, in the event of a negative pressure, would discard potentially contaminated water to the atmosphere instead of allowing it to back siphon into the water system. It simply dumps it out the bottom. RPZ's also contain two independently acting check valves which work to prevent water from flowing back into the public water system. DCV also have two independently acting check valves, but lack a relief valve. DCV are acceptable to be used in aesthetically objectionable facilities.

Selecting the proper device for the application is only one step. Sizing your device properly to ensure that you are able to achieve the desired flow rate is something you will need to consider. Securing help from a Professional Engineer (PE) to assist with the details is a requirement. Your PE will need to submit an Application for Approval of Backflow Prevention Device to your local health officials for approval. The Cross Connection Control Manual outlines proper installation requirements. There is one exception to this rule: If a municipality is installing a backflow device in their own building, such as their own well house, municipal building, or municipal owned fire station and the cost does not exceed $5000, than the licensed water operator can design the plans. Keep in mind you still need to submit an application to your local health department for approval.

Some other things to consider is locating the device in an area that is easily accessible. Backflow preventers are required to be tested every year by a certified tester (we here at NYRWA have



several certified testers on staff) and need to be readily accessible. This picture shows a RPZ on a boiler feed that does not meet the height requirements of 30"- 60" from the ground to the center line of the device, making testing and repairs difficult. Equally, backflow devices should not be too low to the ground either. In the event of flooding and the device was submerged, this water could be siphoned back into the public water system. Granted, certain conditions would have to exist, but remember Murphy's Law. A second reason not to install a device too low and possibly the most important is this. I was once testing a device for an older lady who was the manager of a country club. It was a RPZ that was installed on their sprinkler systems. The device was located very close to

the ground. When I bent over to hook up my testing equipment, this lady suddenly let out a loud gasping noise. It was then that I realized the reason. (I need to mention that I'm not getting any younger ya'll and my pants don't quite fit quite like they use to)

This poor women, who was standing behind me, was getting a bird's eye view of my butt crack. Something no one should ever have to endure. Last I heard she was still getting counseling but is making steady progress and is on the road to recovery. Enough said about that.

Drainage considerations also need to be considered. In the event of a catastrophic failure, (this is a technical way of saying that if one of these bad boys starts dumping water all over the place) that water needs a place to go. A 4" RPZ can dump as much as 650+ gallons of water a minute. Likewise a ¾" RPZ can dump 100+ gallons per minute. You can fill a basement with water pretty fast at this rate. A properly sized drain, one that can handle the flow, will need to be installed. The general rule of thumb is the size of the drain should be 2 times the size of the supply line. (A 2" supply line would require at least a 4" drain line.) This picture shows a 2 ½" RPZ with a 6" drain. It's also equipped with a check valve on the drain line. (I removed the cover for illustration purposes) This prevents cold air from coming back into the building through the drain. I have seen units freeze up from cold air coming back through the drain line. Be sure to install either a trap or check valve to prevent this. No, stuffing a towel down the drain line for the winter months is not a good idea. You just defeated its purpose.

As you can see, there are a lot of details that need to be considered in regards to a Cross Connection Control Program. I could go on but this article is already too long. Print a copy of the Cross Connection Control Manual and read through it. Work closely with your local health department officials. Procrastinating the "brake repair" is a tragedy waiting to happen. Ignoring the regulation like the Bessemer Water Service is not the kind of PR your system needs. Yes, this can be a little expensive, but so is a lawsuit. You, the Certified Operator, are responsible for your system. It's better to be proactive than re-active.

These last pictures illustrate one of the best installations of a dual RPZ I have ever come across. My compliments to "Ryan the Plumber" at SUNY Morrisville for a job well done. 💧💧💧

DUAL RPZ'S FOR UNINTERRUPTED WATER SUPPLY