

COMPONENTS OF A WATER LOSS PREVENTION PLAN

How do the terms “water loss” and “weight gain” relate? Can it be that apathy, procrastination, or plain idleness might apply to both situations? Definitely, good intentions abound with either problem. No one wants to be overweight, just as no one who is responsible for the management and operation of a water utility wants to have excessive water loss. How do we attack these problems? In either case, we must identify the root of the problem, focus on a solution and stick with it! How many times have we heard the phrase, “If you fail to plan, you plan to fail.” A good plan is the key to any long-term solution.

A person’s physical and psychological make-up has a huge impact when attempting to solve the weight problem. Heredity affects us in many ways, but especially in regards to our ability to lose weight. What about the person who accepted the position of manager and soon learned that they had inherited an inadequately operated water system?

Age is another common factor in both problems. A water distribution system that was installed in the WPA days of the 1930’s will most likely experience problems that newly installed water lines will not possess. The older that I get, the harder it is to keep the weight off! We can list other analogies such as our body shapes and sizes compared to the geographical terrain of our utilities and our distribution system sizes. However, let’s get going with a proactive approach to the problem of water loss.

Accurate records are vital to any water loss prevention plan. How do we know the status of our water loss if we do not keep records? There is a water loss template that is available for download from the Kentucky Rural Water Association website (www.krwa.org). This Excel spreadsheet, or a similar record keeping system, can be utilized in a preliminary water audit. The initial step in water loss prevention is the water loss calculation. Secondly we must locate and eliminate all water leaks. Sounds easy, doesn’t it?

The following steps can be utilized to prevent or reduce water loss and should be incorporated into a water loss prevention plan:

1. Read the master meters daily and at the same time each day. At a minimum, they should be read Monday through Friday. This will minimize water loss due to a large leak that can go undetected for a week or month.
2. Read all meters in the distribution system within a 3- to 5-day window. When the meters are read over a 2-week period, this will cause fluctuations of monthly water loss numbers. However, these numbers will average out over a year’s period of time.

3. Divide the distribution system into zones or subsections where possible and calculate water loss for each zone. This will allow for the prioritizing of work based upon the severity of the problem in a particular zone.
4. Utilize computer billing software to generate water loss reports for sections or zones as well as to generate an overall water loss report.
5. Install bypass monitor meters as needed to isolate lines with potential leaks. A 5/8- x 3/4-inch meter will suffice for each 100-customer section of line.
6. Install a 2-inch bypass monitor meter at water storage tanks to isolate sections of the line with potential leaks during the night (1:00 a.m. to 4:00 a.m.)
7. Utilize pressure recordings to detect fluctuating pressures and abnormally low or high pressures in distribution system lines.
8. Test and change-out all meters according to Kentucky Public Service Commission (PSC) regulations. PSC regulations require residential meters to be tested and changed-out in 10-year intervals. Four-inch and larger meters are to be tested annually.
9. It may be feasible to hire a part-time operator to utilize leak detection equipment to search for leaks. A portion of the distribution system could be covered each month.
10. Identify sections of pipe in the distribution system with the most frequent line breaks. Budgeting for infrastructure replacement is imperative in any water utility.
11. Having a main transmission line from the master meter to a water storage tank will reduce pressure fluctuations in the distribution system and result in fewer line breaks.
12. Provide the necessary resources for manpower and equipment to properly maintain the distribution system appurtenances such as gate valves, pressure reducing valves, and hydrants.

Today’s advanced technology can certainly enhance our water loss prevention plan. Computers not only utilize software for spreadsheets to calculate water loss expediently, but can be used in a variety of ways to identify areas of the distribution system with potential leaks. Both master meters and customer meters can be read by satellites or other automated meter reading mechanisms. Telemetry/SCADA systems operated with computers can produce trend charts for water flows, water pressures, and water levels in storage tanks. This kind of data is valuable in determining where leaks are or are not prevalent. Computers analyze hydraulic data

to determine if theoretical and actual water flows and water pressures in the distribution system match. Computerized maps with GPS and GIS data are beneficial when used properly. A water utility's budget is the major limiting factor as to why technology is not used more frequently.

By industry standards, more than 15 percent water loss in a rural system is unacceptable. Probably, no one realizes this more than the managers of water districts, water associations, and investor-owned utilities under the jurisdiction of the Kentucky Public Service Commission. Just as we should be concerned with our health due to being overweight, the PSC is concerned with the financial health and well-being of water utilities under their jurisdiction in Kentucky. PSC inspectors routinely discuss water loss during their inspections. When a water system exceeds 15 percent water loss on their annual report to the PSC, a deficiency is issued. Numerous water systems' response to the PSC's Deficiency Tracking Reports (DTR) has been deemed unacceptable by PSC. A common request from PSC to the water system with a deficiency due to water loss is for a water loss control plan. A good water loss control plan should include the above-mentioned components with a time frame to implement the improvements and follow-up evaluations to measure the success of the plan.

Whether we are weighing in or wading in, we should always do so with a goal in mind. We cannot continue to ignore our problem and hope it resolves itself. Just as there are various diets to control an individual's weight, there are various methods for controlling water loss.

Let's start implementing all of our good intentions!

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