FOCUS on FACILITIES
Diocese of Cleveland Facilities Services Corporation

Mechanical System Water Treatment & Filtration

(Open Systems, Closed Systems)

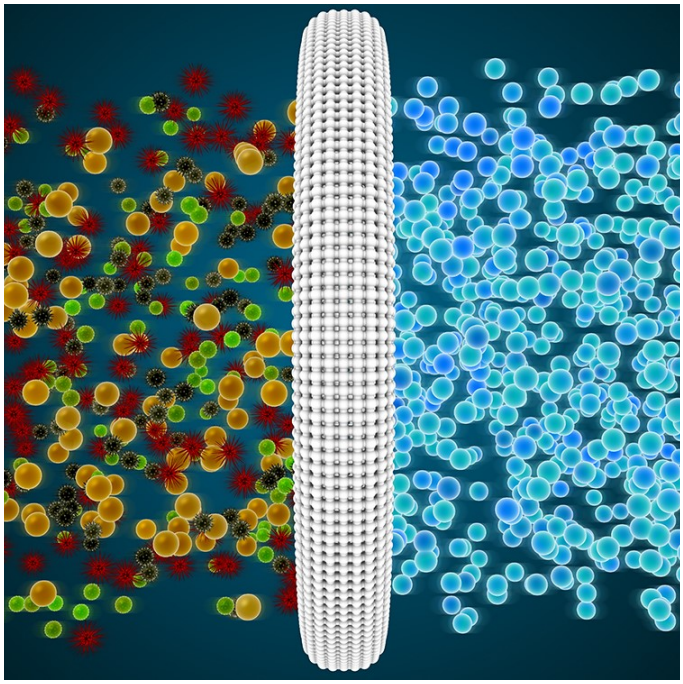
By Howard McKew, P.E., C.P.E.

After reading this month's *Focus on Facilities* column on maintenance of closed and open water systems within a building there will come a time where facility management of the mechanical water treatment services should be revisited for application of new technology.

For the closed systems, there is little to consider for making a change in the methods to chemically treat the water. Where closed or open water system, consideration should be taken towards improving the water filtration, especially if the potable water to building occupants is to be used for drinking or cooking. Open water system chemical treatment improvements can be a useful investment as technology and chemicals may have changed from the existing automatic water treatment systems of the past with digital technology, wireless monitoring, and the chemical treatment impact on the environment continues to evolve.

To get started with revisiting mechanical water treatment, as well as water filtration, the building manager and/or facility person should seek out a couple of local water treatment manufacturer representatives followed by water treatment service contractors to learn about current thinking when it comes to the treatment of mechanical water systems.

For closed loop heating and cooling systems, the search for a manufacturer representative will be one who is proficient in corrosion protections, as well as freeze protection. Key words to use in an internet search are "corrosion protection", "monitoring and treatment of closed loop water systems", "freeze protection", and "water



treatment technology". One will find there are local manufacturer representatives who will welcome an opportunity to meet and discuss the latest in water treatment technology.

With the knowledge obtained from a meeting or two with water solution representatives the next step is to invite a couple of local water treatment service contractors in to complete a walk-around with each contractor to get their input on the existing water treatment conditions and listen to possible improvements that can be made that will also be cost effective to the operation of the heating or cooling water system. The same procedure can be done for investigating the application of water filter(s) or the upgrade of water filters in the portable domestic water systems.

The building manager and facility person could invite in a couple of local chemical treatment service companies in to do a walk-around and hear what each of these service contractors has to say about the existing conditions, performance, and operating cost. As part of this survey the contractor may recommend a water sample be taken and the water analyzed for pH (a figure expressing the acidity or alkalinity of a solution on a logarithmic scale on which 7 is neutral, lower values are more acid and higher values more alkaline).

Observations to be made may be signs of scaling, corrosion, and biological growth. What won't be seen is the impact/fouling factor from these three areas of concern. A second observation should be to identify that the cooling tower has a conductivity -controlled automatic bleed-off valve to assist in maintaining the COC (cycles of concentration) by periodically, throughout the daily operation, removing high concentrations of mineralized water from the tower due to evaporation. Scale formation occurs if the concentration of minerals in a cooling tower increases due to this evaporation. Worth noting, when an automatic bleed-off valve is in operation, the building management can request a credit in the water-sewer bill if a water meter is installed in the water make-up line serving the tower(s). In some cities and towns, the local water department will acknowledge that the water make-up is due to evaporation and blow-down of the cooling tower and that this water is not going into the community sewer system.

Another observation to be made during the walk-around is to confirm that the city water make-up pipe connected to the cooling tower has a backflow preventer required by code to prevent cross-contamination of the chemically treated tower water with the city water serving the building for domestic use.

Summary

Revisiting the mechanical water treatment systems, from an asset management point-of-view is something worth doing annually and documenting the findings. As part of this process, it is well worth inviting local assistance to confirm the water treatment process is adequate, cost-effective, and keeping current with the latest codes. The results of this initiative may be suggested improvements that will increase water system performance, associated equipment performance, and methods to increase personal safety.

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