



Caring for Your Utility Water Systems



COVID-19

Emergency Preparedness

<https://bit.ly/IDEA-COVID-19>

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The Challenge

As an industry, we in District Energy are facing an unprecedented challenge brought about as a side effect of the coronavirus pandemic. All across the country, college dorms, offices, hotels, shopping malls and other facilities are being vacated, and many are shutting down.

This question was first posted on IDEACONnect and merits further discussion.

It is important to have a plan for properly laying up various water systems that may be tangential to our main district energy supply systems for long term non-use. These building systems may be dormant or unoccupied for several months, leaving unused water lines in these buildings stagnant.

Idle Systems

- Boilers and distributed hot water
- Cooling towers, chillers and distributed chilled water
- Domestic potable water
- Related water systems and water features
 - Ice makers
 - Coffee makers
 - Spas, Pools

Boilers

- Facilities with multiple boilers may find they need to take one or more boilers off line.
- Dry storage with either desiccants or inert gas blanketing is the preferred method for idle periods greater than 60 days
 - If inert gases are used, be sure to follow all OSHA Safety Protocols
 - Smaller boilers (> 300 hp) a heat source (light bulb) with fan may be sufficient
- Warm, wet storage is acceptable
 - Oxygen scavenger residuals in the boiler should be approximately 500% of normal operating levels: i.e. if you normally run 20 to 40 ppm of sulfite, maintain 100 to 200 ppm sulfite
 - Maintain 400-600 ppm P-alkalinity during wet storage
 - Boiler should be fired once per week to the point where water circulates for minimum of 1 hour
- Cold wet storage is discouraged

Deaerators, Superheaters & Economizers

- If the boilers are off line:
- Drain all deaerators, feed water tanks, & surge/condensate receivers.
- Drain your superheaters and economizers!
- If you can't drain them:
 - Make sure they are fully flooded
 - Make sure oxygen scavengers levels are 500% of normal

Steam Lines

- If steam lines are idle, make sure all steam traps and condensate receivers are drained.
- Be prepared to dump condensate for several days upon restart due to flash rust developing on the interior surfaces of the lines.
- (STANDBY for more information in future discussion: STARTING UP AGAIN)

Distributed Hot Water Systems

- If at all possible, it is best to keep these systems circulating
- To reduce the risk of possible microbial incursion temperature should ideally be kept at or above 140° F
- Try not to let the system temperature drop below 120° F
- If circulation has to be stopped, try to circulate once every two weeks with bringing the system up to temperature for a minimum of two hours
- If you can not recirculate, be prepared to do a high temperature flush before going back on line. This will be addressed further in Part Two: Starting Up Again

Special Note About HVAC Systems

- Many facilities have a Water Risk Management Plan, such as an ASHRAE 188 or other, to provide guidance and protocols to minimize the risk of water borne pathogens, such as legionella pneumophila in their utility water systems.
- If you have a plan, and it addresses shut down and restarts of this magnitude, you should follow it.
- If you do NOT have a plan, or it does not address shut downs of this magnitude, here are some suggestions for your consideration.

Cooling Towers

- If at all possible, keep the building HVAC systems live to maintain temperature and humidity control.
- If not required for HVAC system operation, the cooling tower, chillers, heat exchangers, and associated piping should be completely drained.
- Leaving the system filled with stagnant water can result in severe corrosion, biofouling problems, and contribute to the transmission of Legionnaire's disease.

Cooling Towers

- If the cooling tower is required for HVAC system operation:
 - Please consult with your local water treatment provider as site specific treatment protocols may be required to help address low load conditions.
 - Inhibitor requirements may need to be adjusted,
 - Microbiological control will be more challenging.
 - Do not discontinue water treatment if the tower is being operated; even if it is just idling.

Distributed Chilled Water

- If at all possible, keep the building HVAC systems live to maintain temperature and humidity control.
- Try and maintain circulation in your main CHW loop, this is especially important in larger thermal storage systems
- Please consult with your local water treatment provider as site specific treatment protocols may be required to help address low load conditions.
- Adjustments to your biological control regimen may be needed
- Be prepared for biological excursions when bringing branch lines back into service. We will address this in future: Starting Up Again

Domestic Potable Water & Related Systems

- Domestic hot water
- Domestic cold water
- Ice machines & coffee makers
- Decorative fountains
- Spas & pools

Biofilm is going to be your enemy

- Biofilm forms in stagnant water
 - Chlorine, bromine, chlorine dioxide and Monochloramine all degrade with time in standing water
 - Eventually your water will have no disinfectant in it
 - Water standing in pipes will gradual rise (or drop) to the ambient temperature of the building they are in
 - Hot water grows colder
 - Cold water gets warmer
 - The ideal growth range for biofilms is 70° to 95° F

Domestic Potable Water

- Keep water heaters set at their designated temperature (ideally at or above 120°F).
- Flush all hot and cold water fixtures (showers, faucets, eyewash stations) at least weekly.
 - Document the flushing schedule with log sheets.
 - Routine flushing may mitigate the necessity of disinfecting the potable water system before the building is reoccupied.
- Periodically monitor the chlorine level at the point of entry and locations throughout the building to ensure flushing provides adequate residuals.
 - Your local water treatment provider should be able to get you simple test kits for chlorine testing.

Related Water Systems

- Drain decorative fountains, hot tubs, and pools completely unless approved treatment and monitoring protocols are maintained.
 - A Legionnaires' disease outbreak in 2019 that resulted in over 140 cases and 3 deaths was linked to a poorly maintained hot tub display.
- Disconnect the water supply to ice machines, coffee makers, water filters, and similar devices.
 - Disinfect inlet lines and install new filters prior to start up. More on this in future: Starting Up Again

Additional Sources of Information

- Please continue to use IDEA Connect and monitor the IDEA Technical Forum
- IDEA has also put together a [COVID-19 Emergency Preparedness Website](#). There, you can find helpful resources and information, including many shared by fellow IDEA members and industry colleagues to provide guidance as you navigate this ever-changing landscape
- All of us together are smarter than any one of us alone...

Questions

- Feel free to visit the Chem-Aqua website at:

www.chemaqua.com

we will be posting frequent updates and additional material as it becomes available

- If you have specific equipment that was not addressed in the presentation, or would like additional information, please feel free to contact me by either e-mail or phone:

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