Guidance for Building Water Systems

Legionella is a bacteria that can grow in building water systems that remain stagnant and are not properly maintained. When water is stagnant, hot water temperatures can decrease to the Legionella growth range (77–108°F, 25–42°C).This can lead to Legionnaires' disease, a type of severe pneumonia, caused by breathing in small droplets of water that contain Legionella bacteria. Legionnaires' disease is deadly for approximately 1 in 10 people who get it. Ensure that your water system is safe to use after a prolonged shutdown to minimize the risk of Legionnaires' disease and other diseases associated with water.

Before your business or building reopens, take the following steps to help ensure the safety of your water system:

Ensure your water heater is properly maintained and the temperature is correctly set.

- Determine if your manufacturer recommends draining the water heater after a prolonged period of disuse. Ensure that all maintenance activities are carried out according to the manufacturer's instructions or by professionals.
- Make sure that your water heater is set to at least 120°F.
- Higher temperatures can further reduce the risk of Legionella growth, but ensure that you take measures to prevent scalding if you water heater is set to >130°F.

Flush your water system.

- Flush hot and cold water through all points of use (e.g., showers, sink faucets).
    - Flushing may need to occur in segments (e.g., floors or individual rooms) due to facility size and water pressure. The purpose of building flushing is to replace all water inside building piping with fresh water.
- Flush until the hot water reaches its maximum temperature.

Clean all decorative water features, such as fountains.

- Be sure to follow any recommended manufacturer guidelines for cleaning.
- Ensure that decorative water features are free of visible slime or biofilm.
- After the water feature has been re-filled, measure disinfectant levels to ensure that the water is safe for use.

Ensure safety equipment, including fire sprinkler systems, eye wash stations and safety showers, are clean and well-maintained.

- Regularly flush, clean and disinfect these systems according to manufacturers' specifications.

Ensure hot tubs/spas are safe for use.

- Check for existing guidelines from your local or state regulatory agency before use.
- Ensure that hot tubs/spas are free of visible slime or biofilm before filling with water.
- Perform a hot tub/spa disinfection procedure before use.
    - CDC Guidance (follow Steps 4–9 and 12–13): https://www.cdc.gov/legionella/downloads/hot-tub-disinfection.pdf
    - Facilities may decide to test the hot tub/spa for Legionella before returning to service if previous device maintenance logs, bacterial testing results or associated cases of Legionnaires' disease indicate an elevated level of risk to occupants. All Legionella testing decisions should be made in consultation with facility water management program staff, along with relevant public health authorities.

Consider developing a comprehensive water management program (WMP) for your water system and all devices that use water if you don't have a plan.

- **Water Management Program Toolkit:** This toolkit is designed to help people understand which buildings and devices need a Legionella water management program to reduce the risk of Legionnaires' disease, what makes a good program and how to develop it. https://www.cdc.gov/legionella/wmp/toolkit/index.html
- **Preventing Legionnaires' Disease - A Training on Legionella Water Management Programs (PreventLD Training):** Take this training from CDC and partners on creating a water management program to reduce risk of Legionnaires' disease. PreventLD Training aligns with industry standards on managing risk of Legionella bacteria. https://www.cdc.gov/nceh/ehs/elearn/prevent-LD-training.html
- **Hotel Guidance - Considerations for Hotel Owners and Managers: How to Prevent Legionnaires' Disease:** https://www.cdc.gov/legionella/wmp/hotel-owners-managers.html
- **Operating Public Hot Tubs for Pool Staff and Owners:** https://www.cdc.gov/healthywater/swimming/aquatics-professionals/operating-public-hot-tubs.html
- **From Plumbing to Patients:** Water management programs in healthcare facilities are an important way to help protect vulnerable patient populations, as well as staff and visitors. https://www.cdc.gov/hai/prevent/environment/water.html
- **Preventing Occupational Exposure to Legionella:** https://www.cdc.gov/niosh/docs/wp-solutions/2019-131/default.html

Ensure cooling towers are clean and well maintained.

- Ensure that cooling towers are maintained (including start-up and shut-down procedures) per manufacturer's guidelines and industry best practices.
- Ensure that the tower and basin are free of visible slime or biofilm before use.
    - If the tower appears well-maintained, perform an online disinfection procedure. (Guidance on disinfection procedures from the Cooling Technology Institute: http://www.cti.org/downloads/WTP-148.pdf)

Maintain your water system.

- Consider contacting your local water utility to learn about any recent disruptions in the water supply. This could include working with the local water utility to ensure that standard checkpoints near the building or at the meter to the building have recently been checked, or requesting that disinfectant residual entering the building meets expected standards.
- After your water system has returned to normal, ensure that the risk of Legionella growth is minimized by regularly checking water quality parameters such as temperature, pH and disinfectant levels.
- Follow your water management program, document activities and promptly intervene when problems arise.

Additional Resources

- CDC Model Aquatic Health Code
- CDC Healthcare Water System Repair and Recovery Following a Boil Water Advisory or Disruption of Water Supply
- ASHRAE Standard 188: Legionellosis Risk Management For Building Water Systemsexternal icon
- ASHRAE Guideline 12: Minimizing the Risk of Legionellosis Associated with Building Water Systemsexternal icon
- Cooling Technology Institute Legionellosis Guideline 2008 (WTP -148)pdf iconexternal icon
- Cooling Technology Institute Legionellosis Guideline 2019 (GLD 159)external icon