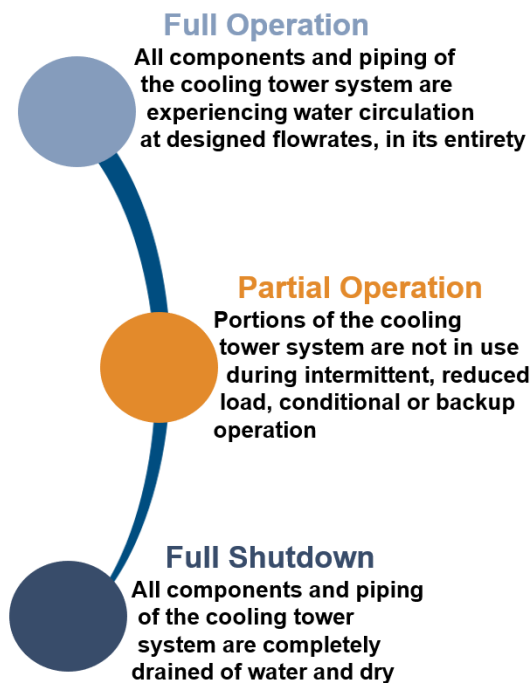


Cooling Tower Operation and Shutdown Guidance

As the cooling season ends, the NYC Health Department is providing guidance on operation and shutdown procedures for cooling tower systems (CTS). Improper shutdown or periods of partial operation may be associated with Legionnaires' disease outbreaks. Use the charts below to identify your system's operating mode and address risks of *Legionella* growth:

Step 1. Identify the Operating Mode *Know Your Control Mechanisms*



Step 2. Update Management Program and Plan (MPP) *Address Risks of Legionella Growth*

For Full Operation:

- Maintain continuous circulation of properly treated water through all piping and components

For Partial Operation:

- Understand the operating modes including when and how a switch occurs when components cycle between operating and standby. Use bypass piping if available to keep water circulating
- Address impacts with a risk assessment any time the system experiences reduced or no water circulation. Limit periods of water stagnation in the condenser loop to reduce formation of biofilm
- Develop procedures for standby or staged operations that may change water volume or introduce contaminants. Include recovery procedures such as cleaning and disinfection prior to use and adjust treatment program for partial operation mode

For Full Shutdown:

- Completely drain the whole cooling tower system including all piping and open components for inspection and cleaning. Protect from stormwater entry and check that system remains clean and dry

Step 3: Implement Your Updated Management Program & Plan (MPP)

Integrate with Operations and Maintenance

Whether in full or partial operation, maintain your CTS as required by NYC cooling tower regulations¹. The Health Department highly recommends continuous circulation of treated water throughout the system. During partial operation, circulate treated water at least once every two days through intermittently used or temporarily isolated equipment.

Two regulatory requirements impact operating modes:

- If all or part of the system has lost circulation or treatment for more than five days, it requires a startup including a cleaning and disinfection (24 RCNY Section 8-05(d))
- During hyperhalogenation, use full operation mode to circulate treated water though every wetted surface including standby or isolated equipment (24 RCNY Section 8-04(f)). If components are never used, consider permanent isolation to prevent dead legs

¹ NYC cooling tower regulations include [Chapter 8 of Title 24 of the Rules of the City of New York](#) (24 RCNY 8 or Chapter 8), [NYC Administrative Code 17-194.1](#), and [NYC Administrative Code 28-317](#).

Examples of Various Modes of Operation for Cooling Tower Systems

Full Operation (Seasonal): Cooling tower system has a fixed startup and shutdown date and largely continuous operation. *Examples:*

- Comfort cooling towers in commercial and residential facilities during the summer.
- Ice skating rinks during the winter.

Full Operation (Annual): Cooling tower system operates continuously to provide cooling except for necessary mechanical maintenance and repairs. *Examples:*

- Constant cooling required for manufacturing, data centers or refrigeration.
- Year-round comfort cooling.
- Other applications where the cooling tower system may never be fully shutdown.

Partial Operation (Intermittent): Cooling tower system with intermittent operation that may include multiple startups and shutdowns due to unique demand. *Examples:*

- Facilities that may need to operate outside of a fixed operating season such as religious institutions, theaters, or concert venues.

Partial Operation (Reduced Load): Reduced loads due to portions of the system being isolated and shutdown. *Examples:*

- Commercial buildings with vacancy or tenant changes (where part of system may be isolated from the rest).
- Mixed use with residential and commercial tenants that may run on different cooling demands, such as commercial side requiring year-round refrigeration while residential needs seasonal cooling.

Partial Operation (Conditional, 24 RCNY 8-03(b)(4)): Cooling tower system components have cycled or staged operations. *Examples:*

- HX/chillers with modular cycles of operation.
- Cooling tower equipment used only during peak summer operation.
- Pumps or other equipment operating in a lead/lag manner.

Partial Operation (Backup Equipment): Intentionally maintaining cooling tower system components wet without system operation. *Examples:*

- Large diameter piping or risers maintained full of water to prevent scaling and fouling that may lead to clogging and maintenance issues at startup.
- Intentionally maintaining filled or partially filled system components such as condensers, cooling towers, heat exchangers, or chillers for rapid startup in the event of unseasonably warm weather or for sudden increase in cooling load such as emergency backup systems for data centers or other critical operations.

Full Shutdown: All components and piping of the cooling tower system are completely drained and dry. Protect from stormwater entry and periodically check that the system remains clean and dry. Any water in your system is considered partial operation.