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Best Practices for Legionella Control in Cooling Tower Systems

Best practices for Legionella control in cooling tower systems require operational and maintenance practices that go above and beyond standard water treatment measures for optimizing equipment performance and general system protection. However, due to the fact that Legionella bacteria is commonly found in potable water and can rapidly colonize building water systems, no maintenance program or practices can guarantee the absence of Legionella.

Current industry standards, which include the recently approved ASHRAE Standard 188 and the new legislation passed in the wake of the Legionnaires' disease outbreak in New York City, recognize the following best practices as effective for Legionella control in cooling systems:

1. Administer a comprehensive and professionally monitored water treatment program for corrosion, deposits, and microbial control utilizing automatic chemical feed and control equipment.
2. Feed an EPA registered chlorine or bromine based biocide 3-7 times per week to achieve an appropriate residual based on label dosage for a minimum of 1 hour, and feed an EPA registered non-oxidizing biocide at target feed rate a minimum of 1 time per week.
3. Implement procedures to establish flow and biocide feed to all offline or intermittently operated equipment for at least 4 hours twice per week. Eliminate all dead legs or establish procedures for maintaining micro-biological control in dead legs. Stagnant conditions in dead legs and offline or intermittently operated equipment including cooling towers, heat exchangers and circulation pumps directly contribute to Legionella growth and hazards.
4. Clean cooling towers twice per year. The presence of sediment, sludge, corrosion by-products, mineral deposits, and microbiological growth in the cooling tower sump and wetted surfaces contribute to Legionella hazards. Documented disinfection procedures should be employed before and after cleaning cooling tower systems. More frequent cleaning and/or disinfection may be required on the results of routine visual inspections and microbiological test results.
5. Disinfect cooling tower systems prior to start-up after a seasonal shutdown or if the system or a system component has been idle more than 5 days.
6. Confirm microbiological control by routine site bacteriological analysis, routine cooling tower and auxiliary equipment inspections, and monitoring heat exchange equipment operation.
7. Routinely inspect cooling towers to evaluate system cleanliness, condition of tower fill, drift eliminators, and water distribution system, and proper operation of water makeup and water treatment equipment.
8. Properly maintain the cooling tower mechanical systems and associated components to reduce hazards associated with Legionella. Cooling tower fill, drift eliminators, water distribution, and water makeup system should be professionally serviced and maintained.
9. Routinely validate effectiveness of program for controlling Legionella hazards. Maintenance and operational procedures should be adjusted as required to achieve target levels.
10. Maintain documentation of all activities associated with cooling tower operation and maintenance including water treatment test results, inspections, disinfections, cleanings, and records of all corrective or remedial activity.

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