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Anti-Microbial Chiller/Cooling Tower & Legionnaires' Disease

Posted on November 3, 2017 by davidc@ccr-mag.com

A new Center for Disease Control and Prevention (CDC) study involving 196 cooling towers nationwide found that 84 percent contained Legionella DNA, indicating that the dangerous bacteria that causes a severe, even fatal type of pneumonia were present or had been at some point. This means the real question is not 'if there will be another outbreak' but only 'where and when' it will occur.

"During 2000–2014, passive surveillance for legionellosis in the United States demonstrated a 286% increase in reported cases per 100,000 population," states the CDC website.

The CDC also estimates that about 5,000 cases of Legionnaires' disease are now reported each year in the United States, and keeping Legionella out of water systems in buildings, with cooling towers a noted risk, is critical in preventing infection.

In response, HVAC contractors now are pairing chillers and high performance plastic cooling towers with new anti-microbial options that significantly reduce the infection risk.

Controlling Pathogen Growth

Throughout the U.S. and most of the world, the mainstay of large cooling systems remains the traditional HVAC combination of chillers, air handlers and cooling towers. Cooling towers have a long history of effective use in expelling heat from the water used in many commercial and industrial applications that involve chillers.

However, it is well established that, under typical operating conditions, cooling towers can propagate Legionella. The design of many cooling towers creates pockets where water may stagnate, a condition that can lead to microorganism development.

This has recently led ANSI/ASHRAE to publish its Standard 188, Legionellosis: Risk Management for Building Water Systems, which documents new risk standards and requirements for the design of new buildings and the renovations to existing structures.

"All facilities with HVAC or process cooling systems need to be aware of Legionnaires' disease and handle any concerns about it," says Rick Hill, Facilities Director at Arkansas Surgical Hospital, a physician-owned hospital specializing in joint and spine surgery in Central Arkansas. "There have to be good procedures in place to prevent or control it."

When it was time to replace an air cooled chiller at Arkansas Surgical Hospital, Steve Keen, President of Powers of Arkansas, the HVAC contractor responsible for the hospital project, recommended and installed a water cooled chiller, paired with an advanced cooling tower with unique anti-microbial properties.

"Legionella is always a concern for HVAC systems using a cooling tower and anywhere you have water exposed to the atmosphere," says Keen. "The Delta Cooling Towers' anti-microbial properties will help prevent that type of growth and exposure to patients and staff."

Delta Cooling Towers, which pioneered the HDPE (high-density polyethylene) plastic cooling tower in the 1970s, recently introduced a line of towers constructed of anti-microbial resin, which is fully compounded into the base cooling tower structural material and casing. The cooling tower fill and drift eliminator are also made from anti-microbial PVC.

The anti-microbial resin contains wide-spectrum additives that operate on a cellular level to

Calendar of events

Late Sept
2018

2017 Commercial Retreat HiLites & 2018 Location

CR 2018 will be held late Sept 2018, location & dates will be confirmed in the CCR Jan/Feb 2018 issue.

Early Aug
2018

2017 Women's Retreat HiLites and 2018 Location

WR 2018 will be held early August, location & dates will be confirmed in the CCR Jan/Feb 2018 issue.

Jan
2018

2018 Commercial Construction & Renovation Summit

2018 Summit Update & 2017 HiLites

The January 2018 Summit will be held Jan 10th-12th in Daytona Beach, FL at The Hilton on the beach.



Locations: TBA

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continuously disrupt and prevent uncontrolled growth of microorganisms and biofilm within the cooling tower. Efficacy tests were performed by Special Pathogens Laboratory, The Legionella Experts®.

Cooling tower design and materials can be very significant in the prevention of pathogen growth. To avoid problems of stagnant water leading to pathogen growth, experts recommend cooling tower designs feature a sloped basin and/or basin sweeper system.

While some cooling tower manufacturers now market a tower with an anti-microbial fill (the medium over which the hot water is distributed as it is being cooled), a superior option is to have a cooling tower featuring the fill, structural casing and sump all composed of anti-microbial material.

“We decided that since we were replacing the air cooled chiller with a water cooled chiller, we wanted a cooling tower that aligned with our philosophy of protecting patient safety,” says Hill, who advocated for the anti-microbial technology and found support for it among his hospital’s leadership. “We want to maintain one of the lowest infection rates among hospitals in the country.”

Arkansas Surgical Hospital already boasts a very low infection rate of under 0.3%, compared to a national average of 3% among U.S. hospitals.

Energy Savings and Longevity

By proactively making the switch to an advanced anti-microbial tower cooler, paired with a very high efficiency HVAC chiller, the hospital is also significantly reducing energy costs, which was also a prime consideration.

“Our previous air cooled HVAC system required a lot of electricity,” adds Hill. “With the water-based cooling tower and very efficient chiller, however, we expect to save tens of thousands of dollars annually in energy costs.”

Durability and longevity of the cooling tower were additional issues that Hill considered.

Metal-clad cooling towers are vulnerable to corrosion from salt air, industrial gasses and even the chemicals used to treat the recirculating water. The best water treatments for Legionella prevention, in fact, are oxidizing biocides which react aggressively toward metal surfaces, effectively attacking metal-clad cooling towers and shortening service life.

As a result, metal cooling towers require increasing patching, maintenance, costly downtime and eventual replacement.

According to Hill, he considered a metal cooling tower, but ultimately decided it would be too difficult to maintain.

“Maintaining a metal cooling tower is more work than we wanted and the units have a shorter life cycle because metal will rust and require mending and repair,” says Hill.

In choosing Delta’s cooling tower, which features a fill, drift eliminator and shell all constructed of corrosion proof anti-microbial plastic, Arkansas Surgical Hospital now has a cooling tower that is impervious to the corrosive effects of ambient air and water treatment chemicals, as well as oxidizing biocides; all of which plague metal-clad cooling towers.

In addition, since the engineered molded plastic cooling towers are one-piece, there are no problems with seams, welds, and patches that wear prematurely. Therefore, the plastic models offer extended longevity and require far less downtime for cleaning, repair or replacement.

“In terms of lifecycle, the Delta Cooling Tower has a 20 year warranty on construction,” concludes Hill. “You don’t get that with a metal cooling tower.”

For more information, visit the web site: www.deltacooling.com.

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The Retail Contractor NEWSLETTER

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