

# 10-Year Effort to Combat #1 Waterborne Disease in the U.S.

EMCOR Government Services and the CDC, taking a leading edge on minimizing risks of Legionnaires' Disease in building water systems.

EMCOR Government Services is setting the standard for helping to minimize the risk of Legionnaires' Disease (Legionellosis) in the built environment. Alan Spence, P.E., RPA, CIT, Director Emeritus of EMCOR's Facilities Solutions Group, was an instrumental team member in the 10-year effort that culminated in ANSI/ASHRAE Standard 188-2015.



Alan Spence, P.E., RPA, CIT

The standard is an essential document for anyone involved in design, construction, installation, commissioning, operation, maintenance, service, and/or ownership of centralized building water systems and components.

Mr. Spence was one of 28 voting committee members representing five balanced interest groups, including Users, Equipment Manufacturers, Water Treatment Providers, Legionellosis Consultants, and General Interests. He provided real-world input during the decade-long preparation of the Standard, based on his extensive 32-year career in professional engineering and facilities operations, his involvement on ASHRAE's Water Treatment Technical Committee (TC-3.6), and his appointment to ASHRAE's Guideline 12 committee in 2000. His role in approving the Standard for publication helped ensure that the resulting requirements are realistic and do not pose undue hardship for building owners or operators.

Mr. Spence was joined by Bill Gains of the Ford Motor Company and Ron Wood of the General Services Administration in the committee's Users interest group. He also worked closely with Janet Stout, President and Director of the Special Pathogens Laboratory at the University of Pittsburgh; microbiologist Claressa Lucas from the Centers for Disease Control and Prevention (CDC); and a number of other notable colleagues.

## Challenging Goals. Successful Collaboration.

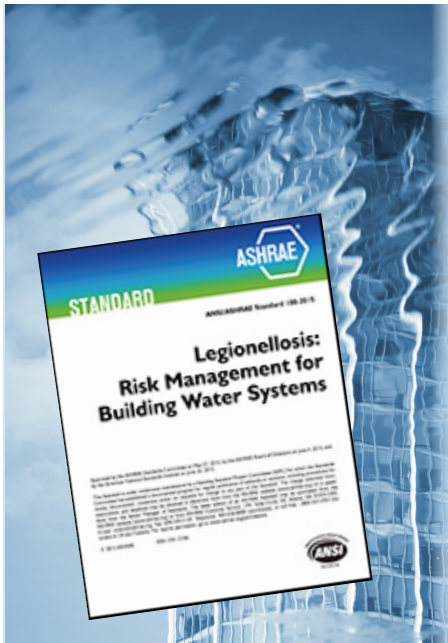
The primary objective of the committee was to publish the most reliable protocols to date for mitigating the risk of Legionellosis without disproportionately favoring or implicating individual interest groups. To this end, all participants were required to document their potential biases. Committee balance was also monitored throughout the effort as some members cycled in and out between 2005 and 2015.

Onboarding new members presented its own challenges, recalls Mr. Spence, since issues that had been agreed upon by predecessors again became fodder for debate. "This created a lot of additional work and lengthened the process," he explains, "but it ensured that the Standard was a well thought out document."

Consideration of medical facilities was another challenging aspect of the process, since immuno-compromised individuals are at greater risk when exposed to Legionella. When the American Society for Healthcare Engineering became involved, the committee reworked several guidelines to ensure that hospital facility needs were addressed.

## Sobering Statistics on Legionnaires' Disease

- » Legionella is the **#1 cause** of waterborne disease outbreaks in the United States—between 8,000 and 18,000 cases are diagnosed annually.
- » According to the CDC, **5% to 30% of these cases are fatal**, and most cases are related to building water systems.
- » Direct healthcare costs alone account for **\$101 to \$321 million annually** in the U.S., according to the CDC.
- » The estimated cost of Legionnaire's Disease, when lawyers' fees and lost time from work is calculated, equates to approximately **\$250,000 per case**.



## Standard 188-2015 Changes at a Glance

The following lists the most prominent regulatory changes enacted by Standard 188-2015.

1. Any building with elements or features that can produce fine mist and potentially expose occupants to Legionella (such as cooling towers, decorative fountains, central domestic hot water systems, water spray humidifiers, spas, and buildings taller than 10 stories) must be surveyed by an appointed Program Team and those risk elements documented each year.
2. The Program Team must establish control points for monitoring for risk (e.g. basins of cooling towers, where microbiological testing can be routinely performed; backflow preventers, where functional testing can be performed; a central hot water heater, where temperatures can be monitored; central hot water return temperature monitoring points; and shower hot water temperature monitoring locations).
3. The Program Team must prepare procedures to treat risk elements.
4. The treatment and intervals of treatment must be documented and monitored.
5. Disinfection procedures for unfavorable bacterial levels must be prepared and documented.
6. A list must be prepared of officials to be notified if there is a Legionnaires' Disease Case, and a person must be appointed to notify the proper authorities.
7. The building must be re-surveyed whenever there is a renovation or building system modification.

## New Standards Help to Minimize Risk

A number of changes have resulted from the publishing of Standard 188-2015. If a facility is taller than 10 stories, or if it has any elements or features that can produce a fine mist that could expose occupants to Legionella, a Program Team must be appointed to survey and document potential risks every year. This team must establish control points for monitoring risk as well as prepare procedures to treat identified risk elements and to disinfect unfavorable bacteria levels. A person must also be appointed to contact the necessary authorities in the event of a Legionnaires case. Should the building or a relevant building system undergo renovation or modification, the building must be re-surveyed by the Program Team.

Getting on board with the new Standard will be an important objective for facilities professionals whose buildings are impacted, particularly since the 2015 deaths in New York have brought Legionnaires' Disease back into public focus. Mr. Spence projects that several states will enforce Standard 188-2015 even before it is adopted by the International Building Code. He suggests that facilities professionals use the Standard as a document to help minimize risk in their buildings and use ASHRAE Guideline 12-2000 as a resource to assist with implementation.

Interestingly, years of extensive committee debate concluded in the CDC and Standard 188-2015 officially discouraging routine testing for Legionella without cause. Hospitals and healthcare

facilities are the only exception, since their occupants face heightened risk of both contracting and dying from the disease. However, for any other building types, the likelihood of false positives from naturally occurring, non-threatening levels of Legionella in the environment outweigh the utility of routine testing. The new Standard instead stresses the importance of taking preventive measures to manage Legionella, upholding a position in Guideline 12-2000: "Testing is not a substitute for sound maintenance practices and water treatment."

### About Alan Spence, P.E., RPA, CIT

In his most recent role as Director of EMCOR Government Services' Facilities Solutions Group, Mr. Spence oversaw a team of mechanical, electrical, and structural engineers, as well as Computerized Maintenance Management System personnel. His varied scope of responsibilities included property condition assessments, due diligence inspections, mechanical and plumbing system condition assessments, Reliability Centered Maintenance (RCM) analysis and consulting, water treatment and Legionellosis consulting and evaluation, Energy Star verification services, and forensic analysis (such as X-ray and ultrasonic evaluation), infrared scanning and analysis, and root cause/failure analysis. Mr. Spence holds a Bachelor of Science in Electro-Mechanical Engineering Technology from Old Dominion University.