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# Tipping the *Legionella* scales

> New ASHRAE standard stands to greatly alter the status quo through use of HACCP water plans.



ASHRAE 188P will carry more weight than a guideline and is written to become a regulation-ready ANSI standard. The 188 draft is the first *Legionella* document in the U.S. to have such broad support among government agencies, industry groups and *Legionella* experts.

Pending ASHRAE Standard 188P, scheduled to be finalized in the first quarter of next year, stands to obliterate the *Legionella* status quo.

Plumbing engineers have been hearing about *Legionella* control for a long time. ASPE was among the first distributors of my book, *Legionellae Control in Health Care Facilities: A Guide for Minimizing Risk*, shortly after it was published in 1996. I presented "Legionella and Other Microbes: The Plumbing Engineer's Role in Prevention" at the 2000 ASPE convention in Nashville, Tenn., and taught a full-day *Legionella* seminar in Boston for ASPE members in 2004. Many others have contributed *Legionella* articles and presentations for plumbing engineers.

The last 15 years have brought new disinfection and filtration technologies,

several guidelines and better methods for diagnosis, but in that time *Legionella* awareness and preventive action have increased only slightly, while reported Legionnaires' disease cases actually have risen in some areas.

ASHRAE aims to change that.

Why will 188P — "Prevention of Legionellosis Associated with Building Water Systems" — likely have a far greater impact on *Legionella* prevention than the existing government and industry guidelines? First, it will be an ASHRAE standard, carrying more weight than a guideline and written to become a regulation-ready ANSI standard. Of perhaps greater significance is the 188 draft is the first *Legionella* document in the United States to have such broad support among government agencies, industry groups and *Legionella* experts.

If properly implemented, ASHRAE 188 will affect the way water systems are managed in hundreds of thousands of buildings in the United States. The core requirement of the pending standard is a Hazard Analysis and Critical Control Point water plan for buildings such as hospitals and nursing homes that have occupants at higher risk of contracting Legionnaires' disease, and for office buildings, apartment buildings, hotels and industrial facilities that have 10 or more stories, centralized water heaters or an incoming water supply with a chlorine concentration of less than 0.5 ppm.

The HACCP process has been used for years to prevent food-related hazards and since 2007 has been recommended by World Health Organization in managing building water systems for the control of *Legionella* bacteria.

Developing and implementing a *Legionella* HACCP water plan boils down to identifying points and processing steps for all building water systems, establishing control measures at points (critical control points) where they can and should be applied, verifying the control measures are implemented within specific performance limits and validating that the plan is effective in preventing Legionnaires' disease.

## Roles for plumbing engineers

Plumbing engineers can play important roles in HACCP plan development by performing water systems surveys and drawing flow diagrams.

A water systems survey for the purpose of developing a *Legionella* HACCP water plan does *not* involve pinpointing or solving *Legionella* problems or assessing the condition of water systems, and thus does not have to be performed by a *Legionella* expert. Any person familiar with water

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## Tipping the *Legionella* scales



All building water systems must be included in the survey and flow diagrams, even ones for which *Legionella* control measures are not applied. Each system must be named and numbered.

system components can do a survey because the objectives are simply to identify points and processing steps in the water systems – from the public water main taps to the points of use.

In a hotel, for example, you would identify where the water is fed into the campus, where it enters buildings, where it's softened, heated or otherwise processed, and the types of devices (e.g., faucets, showers, drinking fountains, ice machines) at points of use. You also would note backflow preventers, mixing valves and hot water recirculation pumps. Cooling towers, pools and hot tubs, misting systems and decorative fountains – and the water supply to each of them – also need to be identified.

After the water system points and processing steps are identified, a plumbing engineer would draw two flow diagrams for the hotel, one for potable and one for nonpotable systems. Flow diagrams for HACCP plans do not need to show the piping layout, pipe sizes or valves, or be drawn to scale. They merely illustrate the flow relationship among systems.

Photo courtesy of Mark Freije

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Developing and implementing a Legionella Hazard Analysis and Critical Control Point water plan for buildings such as hospitals begins with identifying points and processing steps for all building water systems.

All building water systems must be included in the survey and flow diagrams, even ones for which Legionella control measures are not applied (e.g., fire protection, irrigation and heating hot water systems). Each system must be named and numbered.

Pictures are not required in Legionella HACCP water plans but can make them easier to understand and implement. Plumbing engineers or other vendors performing a water systems survey might want to refer to pictures after the onsite visit. Pictures also will help HACCP team members who are relatively unfamiliar with plumbing systems and cooling towers. In a hospital, for example, the facilities director will know what a pressure-reducing valve, Y-type strainer and drift eliminator are, but an administrator or infection control director may not.

Most larger commercial and industrial facilities have at least one employee capable of doing HACCP water systems surveys and flow diagrams but many organizations prefer to hire out for it to be done, looking to an engineering firm, water treatment company, or consulting firm to survey their facility and provide the HACCP plan. This gives plumbing engineers an opportunity to perform a needed service for a fee.

The purpose of ASHRAE 188P is not just to affect the management of building water systems, but ultimately to protect health and life. Plumbing engineers can and should be a part of that effort. **pm**

*Matt Freije is the founder and president of HC Info. He earned a mechanical engineering degree from Purdue University and a graduate certificate in epidemiology and biostatistics from Drexel University. He teaches Legionella courses, consults and recently developed a Legionella HACCP water plan configuration tool. Parts of this article were excerpted and adapted from "Preparing to Develop a Legionella HACCP Water Plan," a self-paced online training program written and narrated by Freije.*

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