



## Legionellosis: Risk Management for Building Water Systems

### ASHRAE 188P: 4<sup>th</sup> Public Review, 2014

The first public review of Standard 188P was published in October 2010. It has since gone through three iterations, with the most recent published on September 26<sup>th</sup>. Previous versions of the proposed standard were based on a risk management program called Hazard Analysis and Critical Control Points (HACCP). In the food industry, HACCP is a federally mandated program that has defined microbiological limits for pathogens and specific testing requirements to mitigate the risk of Food borne infections. However, none of these criteria exist for the water pathogen, Legionella. Furthermore, there is seldom a critical control point in water systems that can guarantee microbiological safety. In food plants, critical control points, such as ovens and retorts, can ensure the absence of food pathogens when properly operated. Instead, for building water systems, it comes down to taking reasonable precautions that minimize the risk of Legionella being present in potable water or cooling tower water.

The current version of 188P relies upon building management to assemble a team of qualified individuals to define the details of a risk management plan. The composition of the team can be anyone that has a professional interest in maintaining public safety, i.e., building employees, water treatment suppliers and water treatment consultants. Healthcare providers are held to a higher standard (see Table below) because the risk of a building occupant becoming ill from Legionella is inherently much higher in a health care facility.

*ASHRAE 188P Proposed Standards*

	Previous Public Reviews	Current (4th) Public Review
Title	Prevention of Legionellosis Associated With Building Water Systems	Legionellosis: Risk Management for Building Water Systems
Purpose	Procedures for Legionellosis Prevention	Minimum Requirements for a Legionellosis Risk Mitigation Program
Scope	Buildings: all except single family residences Personnel: all those associated with the building management	Unchanged
Risk Management Program	Based upon identification and management of the critical control points as prescribed by HACCP	Based upon identification and management of all control points
Risk Management Team	Any combination of building employees, suppliers, risk consultants	Unchanged except for health care facilities. Health care: senior organizational leader, facilities maintenance and infection control all required
Validation	Testing for Legionella or monitoring of Legionellosis	Unchanged

Defining the details of a risk management plan can be a daunting task but it is always best to make the plan as simple as possible so that it can be easily understood and implemented. The diagram below describes a risk management plan defined by its three components. The risk management plan begins by identifying the location and seriousness of the **hazard** (Legionella), followed by ways to **mitigate** the risk and finally, **validating** if the plan is effective. Rather than monitoring for Legionellosis, the most effective way to validate the effectiveness of a plan is to monitor the occurrence of Legionella in areas that have been associated with generating air borne mists of the bacteria. Areas of concern include cooling towers, shower heads, drinking water faucets and decorative fountains. Other methods of validation are indirect or rely upon historical records of disease occurrence.



There are two laboratory methods by which the presence of Legionella can be detected. They are the relatively new method of PCR (Polymerase Chain Reaction) and the traditional method of agar based culture. Weas Engineering believes that PCR will eventually replace culture methods and can be useful in identifying the source of Legionellosis infections. However, for Legionella surveillance, we will rely upon the culture method recognized by the CDC as the gold standard for Legionella detection. Furthermore, Weas Engineering recommends the use of Petri plates instead of dip slides for Legionella surveillance as they provide the greatest level of sensitivity.

Weas Engineering believes that the most effective way to validate a Legionellosis risk management plan is to test for Legionella bacteria with the goal of none detected. As the diagram above indicates, a risk management program is a continuous cycle of re-evaluation. This method of constant vigilance which includes plan validation has been extremely effective in developing safety programs around the world. It can also be used by your water management team to minimize the risk of building occupants becoming infected with disease causing mists of Legionella.