ADDENDA

ANSI/ASHRAE Addendum h to
ANSI/ASHRAE Standard 188-2015

Legionellosis: Risk Management for Building Water Systems

Approved by the ASHRAE Standards Committee on June 23, 2018; by the ASHRAE Technology Council on June 27, 2018; and by the American National Standards Institute on June 28, 2018.

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FOREWORD

Addendum h modifies the text of Standard 188 to use code-intended language wherever possible.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum h to Standard 188-2015

Modify Section 3 as shown. The remainder of Section 3 is unchanged.

beneficial occupancy: stage of construction when all or part of a building is to be occupied for its intended ~~the~~ purpose ~~for which it was constructed~~, whether before or after completion.

multiple housing units: a classification of housing where multiple separate housing units for residential and commercial inhabitants are contained within one ~~building~~ or ~~several~~ more buildings within one complex.

nonpotable: water that is not ~~safe~~ fit for drinking or for personal or culinary use and that has the potential to cause harmful human exposure to *Legionella.*

program documents: procedures, work instructions, specifications, and records for all activities of the *Program*, established or collected by the *Program Team* and residing in one or more locations and formats.

risk management: systematic ~~practices~~ activities to reduce *risk*.

validation: initial and ongoing confirmation that the *Program*, when implemented as designed, ~~effectively~~ *controls* ~~the~~ *hazardous conditions* throughout the *building water systems*.

Modify Section 4 as shown.

4. COMPLIANCE

The results of each Section 4 compliance determination and the associated building survey in Section 5 shall be documented and shall be ~~available~~ physically or electronically on site for review by the *authority having jurisdiction (AHJ)*. This standard does not use or require compliance, training, or certification in any additional *hazard* analysis, *risk* assessment, or *risk management* methodologies.

4.1 Building Designer Requirements

4.1.1 The building designer shall review each new building design and its water systems to determine if the design contains any of the devices or factors described in Section 5 that relate to *legionellosis.* If the building and associated property has

a. any of the *building water systems* listed in Section 5.1, then all of those *building water systems* in the new building design shall comply with all applicable requirements of Section 8 of this standard.
b. any of the factors listed in Section 5.2, then the new building design shall comply with the requirements of Section 8 of this standard.

4.2 Building Owner Requirements

4.2.1 The building owner shall survey each existing building, new building, and any renovation, addition, or modification to an existing building and its water systems as described in Section 5. The survey and conformance with the compliance requirements of Section 4 shall be completed prior to occupancy of a new building and before construction begins on renovations, additions, or modifications to existing buildings. If the building and associated property has

a. any of the *building water systems* listed in Section 5.1, then all of those *building water systems* shall comply with the requirements of Section 6 and all applicable requirements of Section 7 of this standard.
b. any of the factors listed in Section 5.2, then all potable *building water systems* and all *building water systems* listed in Section 5.1 shall comply with the requirements of Sections 6 and all applicable requirements of Section 7 of this standard.

Modify Section 4.3.2 as shown.

4.3.2 Buildings containing health care facilities that meet the qualifications in Sections 4.3.2(a) and 4.3.2(b) shall comply with either the requirements in Sections 4.2, "Building Owner's Requirements", or the requirements in Normative Annex A, "Health Care Facilities":

a. The health care facility is accredited by a regional, national, or international accrediting agency or by the *authority having jurisdiction (AHJ)* over the health care facility Infection Prevention and Control (IC) activities.
b. The health care facility IC program
   1. within the U.S. has an infection preventionist ~~that~~ who is certified in infection prevention and control (CIC certification) by the Certification Board of Infection Control and Epidemiology (CBIC) ~~or other regional, national, or international certifying body~~, or the health care facility has an epidemiologist with a minimum of a master's degree ~~or equivalent~~; or
   2. outside the U.S. has an infection preventionist who is certified in infection prevention and control by the responsible regional, national, or international certifying body, or the health care facility has an epidemiologist with a minimum of the equivalent of a U.S. master's degree.

Modify Section 5.2 as shown.

5.2 The building shall be surveyed to determine whether it is characterized by one or more of the following factors that relate to *legionellosis*:

a. ~~It~~ The building includes *multiple housing units* with one or more centralized potable water-heater systems.

b. ~~It~~ The building is more than 10 stories high, ~~(~~including any levels that are below grade~~)~~.

c. ~~It~~ The building is a health care facility where patient stays exceed 24 hours.

d. ~~It is a~~The building contains~~ing~~ one or more areas for the purpose of housing or treating occupants receiving treatment for burns, chemotherapy for cancer, or solid organ transplantation or bone marrow transplantation.

e. ~~It is a~~ The building contains~~ing~~ one or more areas for the purpose of housing or treating occupants that are *immunocompromised*, *at-risk*, are taking drugs that weaken the immune system, have renal disease, have diabetes, or have chronic lung disease.

f. ~~It is a~~The building is identified by the owner or *designee* as being for the purpose of housing occupants over the age of 65 years.

Modify Section 6.2 as shown. The remainder of Section 6.2 is unchanged.

6.2 *Program* development. When the building survey required by Sections 4 and 5 indicates the presence of one or more of the *building water systems* listed in Section 5.1 but none of the factors listed in Section 5.2, a *Program* shall be implemented to manage the *risk* of *legionellosis* for those *building water systems* listed in Section 5.1. When the building survey required by Sections 4 and 5 indicates the presence of one or more of the factors listed in Section 5.2, a *Program* shall be implemented to manage the *risk* of *legionellosis* for *potable building water systems* and for *building water systems* listed in Section 5.1. A summary of the program development steps are represented in Figure 1. The *Program* shall be detailed in a plan that embodies all of the principles described in Section 6.1 and shall include the elements described in the following subsections.

6.2.1 *Program Team.* Identify the persons on the *Program Team* responsible for developing and implementing the *Program* and its tasks. The *Program Team* shall include one or more individuals selected from the following: the building owner or *designee*, employees, suppliers, consultants, or other individual or individuals that the building owner has delegated to have authority and responsibility for the actions required by the *Program*. The *Program Team* shall be permitted to delegate *Program* tasks to subgroups. The *Program Team* shall have knowledge of the *building water system* design and water management as related to *legionellosis*.

[. . .]

6.2.4 *Analysis of Building Water Systems.* The *Program Team* shall use the *process flow diagrams* in Section 6.2.3 to evaluate where *hazardous conditions* have the potential to occur in the *building water systems* and determine where *control measures* shall be applied to *control* potentially hazardous system conditions. The analysis shall ~~consider~~ include the vulnerability of occupants and shall include the *building water systems* identified in Section 5.1. The analysis shall include provisions to respond to *water service disruptions*.

6.2.5 *Control Measures.* Based on the results of the *analysis of building water systems* in Section 6.2.4, the *Program Team* shall determine the *control measures* to be maintained. *Control measures* shall include preplanning of physical design and equipment siting. *Control measures* shall include treatment methods, technical and physical processes, and procedures and activities or actions that monitor or maintain the physical or chemical conditions of water to within established *control limits*.

a. ***Control Locations.*** The *Program Team* shall determine the locations in the *building water system* where *control measures* are required.

b. ***Control Limits.*** The *Program Team* shall determine a maximum value, minimum value, or range of values ~~to which a~~ for chemical ~~or~~ and physical parameter~~s must be maintained~~.

[. . .]

6.2.8 *Program* Confirmation. The *Program Team* shall establish procedures to confirm, both initially and on an ongoing basis, that the *Program* is being implemented as designed. The resulting process is *verification*. The *Program Team* shall establish procedures to confirm, both initially and on an ongoing basis, that the *Program*, when implemented as designed, *controls* the *hazardous conditions* throughout the *building water systems.* The resulting process is *validation*. The *Program Team* shall determine whether *testing* for *Legionella* shall be performed and if so how test results will be used to *validate* the *Program*. If the *Program Team* determines that *testing* is to be performed, the *testing* approach, including sampling frequency, number of samples, locations, sampling methods, and test methods, shall be specified and documented. The *Program Team* shall ~~consider~~ include the following as part of the determination of whether to test for *Legionella*:

a. *Program control limits are not maintained* in the *building water systems*, including in water systems with supplemental *disinfection*.

b. A health care facility provides in-patient services to *at-risk* or *immunocompromised* populations.

c. A prior history of *legionellosis* is associated with the *building water system*.

Modify Section 7.1.1 as shown.

7.1.1 System Start-up and Shutdown. The *Program documents* shall include procedures for

a. flushing and *disinfection* before commissioning any new system;

b. shutdown, including any draining, purging, cleaning treatment, and *control* settings;

c. any unplanned loss of operating energy, loss of water treatment chemicals, or system component repair or replacement;

d. restarting ~~safely~~ from a drained shutdown condition and from an undrained shutdown condition;
e. *monitoring* and treatment following water supply interruptions or breaks in water supply piping; and
f. reestablishing required temperatures throughout the hot water distribution system.

Modify Section 7.1.2 as shown.

7.1.2 System Maintenance. The *Program documents* shall include procedures for

a. inspection of, and inspection schedule for, water-containing vessels and system components;
b. flushing or mixing of stagnant or low-flow areas;
c. maintenance and *monitoring* procedures based on equipment manufacturers' instructions for cleaning, *disinfection*, replacement of system components, and other treatments ~~that~~ the *Program Team* decides are necessary for the following:
   1. Hot water and cold water storage tanks
   2. Ice machines
   3. Water-hammer arrestors
   4. Expansion tanks
   5. Water filters
   6. Shower heads and hoses
   7. Electronic faucets
   8. Aerators
   9. Faucet flow restrictors
   10. Nonsteam aerosol-generating humidifiers
   11. Water heaters
   12. ~~Infrequently~~ Low-use~~d~~ equipment, including eyewash stations and showers
   13. Other equipment identified by the *Program Team*;
d. maintaining and storing instructions and forms for inspection notes and a *corrective action* log; and
e. maintaining and storing component and equipment operating manuals.

Modify Section 7.2 as shown. The remainder of Section 7.2 is unchanged.

7.2.1 Equipment Siting. Prior to the beginning of construction of new or replacement open-circuit cooling towers, closed-circuit cooling towers, or evaporative condensers, ~~drawings~~ *construction documents* shall be reviewed and the following items shall be addressed:

[. . .]

7.2.2 New-System Start-Up. The *Program* document shall include procedures for cleaning steps that are part of the commissioning of the cooling system. The *Program* document shall ~~also~~ include procedures for management and *control* means of ensuring that ongoing water treatment is initiated immediately once the system is charged with water.

7.2.3 System Maintenance. The *Program* documents shall include

a. a schedule for inspection of ~~general~~ system cleanliness, of drift eliminator condition and fill material condition, and of water distribution system operation;
b. requirements and schedule for basin or remote sump cleaning and purging of stagnant or low-flow zones; and
c. documentation requirements.

7.2.4 Water Treatment. The *Program* documents shall include the water treatment requirements to *control* microbiological activity, scale, and corrosion, and shall ~~also~~

a. specify all equipment and chemicals used for the purpose of treating the open recirculating loop;
b. include the minimum required schedule for inspection, maintenance, and *monitoring*, and a *corrective actions* plan; and
c. identify the minimum requirements for documenting system water treatments.

[. . .]

7.2.6 *Disinfection* of Cooling Towers and Evaporative Condensers. The *Program documents* shall include procedures and identify the responsible person for initiating the process for:

a. remedial *disinfection* while in operation, including the conditions that require ~~its~~ the application of remedial *disinfection*; and
b. emergency *disinfection*, including the conditions that require ~~its~~ the application of emergency *disinfection*.

7.2.7 Location of Cooling Tower Makeup Valve. The *Program documents* shall include requirements for the location of cooling tower makeup valves and for maintaining compliance with all applicable local, regional, and national codes and regulations for air gaps and backflow preventers. If ~~no~~ such codes and regulations do not exist for the location, then the *Program* shall include requirements for maintaining compliance with ASME/ANSI A112.1.2[1] for air gaps and for maintaining compliance with codes and regulations applicable to other locations, selected by the owner or *designee*, for backflow preventers.

7.2.8 Contingency Response Plan. The *Program documents* shall include:

a. procedures to be followed if there are known or suspected cases of *legionellosis* associated with the use of cooling towers and evaporative condensers;
b. directions issued by national, regional, and local health department authorities;
c. if the *Program Team* determines *testing* for *Legionella* or other pathogens shall be performed, procedures shall include criteria for when and where the tests shall be performed, ~~proper~~ sampling procedures, and the interpretation of test results;
d. procedures for emergency *disinfection*;
e. procedures for other actions identified by the *Program Team* to prevent exposure to contaminated water.

Modify Section 7.3.1 as shown.

7.3.1 ~~General~~Applicable Codes. Public whirlpool spas and their operation shall comply with national, regional, and local codes.

Modify Section 7.3.4 as shown.

7.3.4 Water Quality, *Disinfection*, and *Monitoring*. The *Program documents* shall include procedures for

a. the scheduled changing of whirlpool spa water;
b. maintaining the pH of the water within the range specified by local, regional. and national codes and regulations;
c. maintaining *disinfectant* levels, the products to be applied, and requirements to follow *disinfectant* label directions;
d. shock *disinfection* of the whirlpool spa at the end of each day by achieving the *disinfectant residual* and minimum circulation time ~~recommended~~ specified by the *disinfectant* manufacturer;
e. maintenance of the *disinfection* system in accordance with the manufacturer's instructions;
f. a measurement schedule and logbook of all residual *disinfectant* measurements;
g. recording *corrective actions* in logbooks; and
h. recording operations in logbooks maintained for the periods specified in local, regional, and national codes and regulations and for at least 12 months and retained for at least an additional 12 months.

Modify Section 7.3.5.3 as shown.

7.3.5.3 Contingency Response Plan. The *Program documents* shall include

a. procedures to be followed if there are known or suspected cases of *legionellosis* associated with the use of whirlpool spas;
b. directions issued by national, regional, and local health department authorities;
c. ~~if~~ when the *Program Team* determines *testing* for *Legionella* or other pathogens shall be performed, procedures shall include criteria for when and where the tests shall be performed, ~~proper~~ what sampling procedures shall be used, and ~~the~~ how to interpret ~~interpretation of~~ test results;
d. procedures for emergency *disinfection*; and
e. procedures for other actions identified by the *Program Team* to prevent exposure to contaminated water.

Modify Section 7.3.6 as shown.

7.3.6 Operating Manual. The *Program documents* shall include procedures for regularly updating all operating manuals for filters, pumps, and *disinfection* equipment and for maintaining ~~them~~ the *Program documents* at ~~a~~ one or more ~~secure~~ locations accessible to maintenance personnel.

Modify Section 7.4.1 as shown.

7.4.1 Equipment Siting. Prior to beginning construction of an ornamental fountain or other water feature, ~~drawings~~ *construction documents* shall be reviewed and the following items shall be addressed:

a. Potential organic contamination from adjacent sources
b. The capacity of ~~Inadequate~~ drains and the impact of stagnant areas
c. ~~Inadequate access~~Access to pumps, filters, tanks, and treatment equipment
d. ~~External heat sources and inadequate~~ The potential for external heat sources and reduced airflow that ~~increase the~~ cause water temperatures favorable to the *growth* of ~~and thereby increase the *risk* of exposure to~~ *Legionella*

Modify Section 7.4.3 as shown.

7.4.3 Maintenance. The *Program documents* shall include procedures for regular cleaning; for cleaning the visible buildup of dirt, organic matter, or other debris; and for maintaining pumps and filters as ~~recommended~~ specified in ~~by~~ the manufacturer's instructions.

Modify Section 7.4.4 as shown.

7.4.4 Water Treatment. The *Program documents* shall include procedures for

a. the weekly cleaning~~,~~ and *disinfection* of equipment and components~~,~~ and replacement of water in systems with total water volume <5 gal (20 L); or for when ~~for the periodic use of~~ to apply a *disinfectant*, ~~the products to be applied, and a requirement to~~ following the *disinfectant* manufacturer's instructions~~directions~~;
b. when ~~the periodic~~ to apply ~~use of~~ a *disinfectant*, ~~the products to be applied, and a requirement to~~ following the *disinfectant* manufacturer's instructions~~directions~~ for systems ≥5 gal (20 L); and
c. maintaining water temperature within the *control limits* in the *Program*.

Modify Section 7.5.1 as shown.

7.5.1 Equipment Siting. Prior to beginning construction or installation of new or replacement aerosol-generating misters, atomizers, air washers, or humidifiers, ~~drawings~~ *construction documents* shall be reviewed and the following items shall be addressed:

a. The ~~Potential~~ potential for contamination from building systems, facility processes, or other sources ~~that can be drawn into the system~~
b. Access to pumps, filters, and treatment equipment for maintenance and inspection
c. The potential for external heat sources and ~~restricted~~ reduced airflow that ~~increases the~~ cause water temperatures favorable to the *growth* ~~and thereby the *risk* of amplification of exposure to~~ of *Legionella*.

Modify Section 7.5.3 as shown.

7.5.3 System Maintenance. The *Program documents* shall include procedures for

a. a maintenance schedule and instructions for maintaining air-washer mist eliminators, evaporative cooler/humidifier media, spray nozzles, water distribution system operation, and other equipment and components identified by the *Program Team*;
b. a maintenance schedule and instructions for cleaning basins and remote sumps and for cleaning and purging stagnant and low-flow zones; and
c. maintenance procedure documentation, inspection documentation ~~notes~~, and *corrective actions*.

Modify Section 7.5.5 as shown.

7.5.5 System Shutdown and Start-Up. The *Program documents* shall include procedures for

a. system shutdown, including any required chemical pretreatment or pump cycling, and procedures for shutdown periods that exceed the number of idle days specified by the *Program Team*;
b. system start-up from a drained condition; and
c. system start-up from an undrained or ~~(~~stagnant~~)~~ condition that exceeds the number of idle days specified by the *Program Team*.

Modify Section 8.1 as shown. The remainder of Section 8.1 is unchanged.

8.1 ~~General~~Design Documents. When designing for new construction, renovations, refurbishment, replacement, or repurposing of a facility, the following shall be documented:

Modify Section 8.4 as shown.

8.4 Commissioning. Instructions for commissioning of all *building water systems* shall be provided to the building owner or *designee*. Commissioning shall include the following:

a. Procedures for flushing and *disinfection*
   1. Procedures shall meet the requirements of AWWA C651[2] or AWWA C652[3] or comply with all applicable national, regional, and local regulations.
   2. *Disinfection* and flushing shall be completed within three weeks prior to whole or partial *beneficial occupancy*.
      i. If *beneficial occupancy* of any part of the building is delayed more than two weeks but less than four weeks after *disinfection*, flushing of all fixtures shall again be completed.
      ii. If *beneficial occupancy* of any part of the building is delayed four weeks or more after *disinfection*, the need for *disinfection*, ~~and/or~~ flushing, or both *disinfection* and flushing of ~~for~~ unoccupied areas shall be determined ~~by a *risk* assessment conducted~~ by the ~~water~~ *Program Team*.
b. Confirmation that *building water system* performance meets design performance parameters documented in Sections 8.2.1 and 8.3.

Modify Normative Annex A, "Health Care Facilities," as shown. The remainder of Normative Annex A is unchanged.

A1. SUPPLEMENTAL DEFINITIONS FOR TERMS USED IN ANNEX A

[. . .]

epidemiologically linked case: a case in which transmission of the infection from a health care facility point source by the usual modes is plausible.

[. . .]

A2. DESIGNATED TEAM

A2.1 Senior organizational leadership shall select the individual responsible for leading the *Designated Team* from the group responsible for compliance with physical environment accreditation standards. The membership of the *Designated Team* shall include, but is not limited to

a. a person with senior organizational leadership authority to make command decisions about water restrictions or other response measures;
b. a member of the facilities management staff ~~familiar~~ with knowledge of the *building water systems*; and
c. a member of the health care facility Infection Prevention and Control (IC) program
   1. within the U.S., who is an infection preventionist certified in infection prevention and control (CIC certification) by the Certification Board of Infection Control and Epidemiology (CBIC) ~~or by an equivalent regional, national, or international body~~, or who is an epidemiologist with a minimum of a master's degree ~~or equivalent.~~; or
   2. outside the U.S., who is an infection preventionist certified in infection prevention and control by the responsible regional, national, or international certifying body, or who is an epidemiologist with a minimum of the equivalent of a U.S. master's degree.

[. . .]

A3. WATER SYSTEM FLOW DIAGRAM

A3.1 The *building water systems* shall be graphically represented in *water system flow diagrams*. These diagrams shall enable the identification, analysis, and management of the *risk* of *legionellosis* throughout the *building water systems*. The following is a listing of elements to be ~~considered~~ reviewed for inclusion into the flow diagram:

[. . .]

e. all areas where *hazardous conditions* have the potential to contribute to ~~the potential for~~ *Legionella* ~~amplification~~ *growth*, including ~~but not limited to the following~~
   1. all clinical support areas, including dietary and central sterile, and

2. all patient care areas, including dialysis, respiratory therapy, and hydrotherapy;

[. . .]

A4. RISK MANAGEMENT PLAN

A4.1 The *legionellosis risk management plan* must be contained within one or more documents. These documents are allowed to contain information that is not part of the *legionellosis risk management plan*, and a master document providing the location of all plan documents hall be maintained. The *legionellosis risk management plan* at a minimum shall include

[. . .]

i. disease prevention responses to elevated *risk* through *monitoring* of disease surveillance, including but not limited to
   1. notification of relevant IC, Environment of Care (EC)/ facilities management, provider staff of any test results that indicate elevated potential for *Legionella* ~~amplification~~*growth*, transmission, or infection;
   2. procedures to be implemented when *monitoring* of *control measures* indicates deviation from *control limits*; and
   3. a determination if, when, where, and how environmental *testing* for *Legionella* is to be performed;

j. actions to be taken ~~if~~ when the IC department identifies ~~probable or confirmed~~ *legionellosis* cases that are *epidemiologically linked* to the health care facility; the actions shall
   1. follow established IC processes, including compliance with ~~most recent~~ the current requirements of the U.S. Centers for Disease Control and Prevention (CDC) or other regional or national authority;
   2. include implementation of remediation actions as necessary;
   3. include evaluation of the *legionellosis risk management plan* and any necessary changes; and

k. procedures established by the *Designated Team* to confirm initially and on an ongoing basis that the *legionellosis risk management plan* is implemented as designed (*verification*) and that, when implemented as designed, the *legionellosis risk management plan* ~~effectively~~ *controls* the *hazardous conditions* throughout the *building water systems (validation)*.

[. . .]

A5. EXISTING BUILDINGS, NEW CONSTRUCTION, AND RENOVATIONS

[. . .]

A5.2 For new construction and renovations, the *Designated Team* shall review the scope of work and determine the *risk* associated with the project, and the senior organizational leadership or their *designee* shall require the building designer and builder:

a. to work cooperatively with the *Designated Team* to conduct an evaluation and estimate of the likelihood of *legionellosis* for the project as specified in Section A4.1.5; based on the results of this evaluation and estimate, the *Designated Team* shall modify the *legionellosis risk management plan* as necessary for the project (1) during the early planning, (2) during each phase of design and construction, and (3) during commissioning;
b. to work cooperatively with the *Designated Team* to comply with all applicable portions of Section ~~8~~9, "Requirements for Designing Building Water Systems";

[. . .]

A6. BUILDING WATER SYSTEM PROCEDURES

A6.1 The *legionellosis risk management plan* shall include procedures for the following *building water systems* or shall include a determination and rationale by the *Designated Team* for any procedures that are not required:

a. **Potable Water Systems**
   1. **Systems Start-Up and Shutdown.** The *legionellosis risk management plan* documents shall include procedures for
      i. flushing and *disinfection* before commissioning any new system;
      ii. shutdown, including any draining, purging, cleaning treatment, and *control* settings;
      iii. any unplanned loss of operating energy, loss of water treatment chemicals, or system component repair or replacement;
      iv. restarting ~~safely~~ from a drained shutdown condition and from an undrained or ~~(~~stagnant~~)~~ shutdown condition;
      v. *monitoring* and treatment following water supply interruptions or breaks in water supply piping; and
      vi. reestablishing required temperatures throughout the hot water distribution system.
   2. **System Maintenance.** The *legionellosis risk management plan* documents shall include procedures for:
      i. inspection and the inspection schedule for water-containing vessels and system components;
      ii. flushing or mixing of stagnant or low-flow areas;
      iii. maintenance and *monitoring* procedures based on equipment manufacturers' ~~recommendations~~ instructions for cleaning, *disinfection*, replacement of system components, and other treatments the *Designated Team* decides are necessary for:

[. . .]

(l) ~~infrequently~~ low-use~~d~~ equipment, ~~including~~ such as eye-wash stations and showers;

(m) other equipment identified by the *Designated Team*;

(n) maintaining and storing instructions and forms for inspection ~~notes~~ documents and a correction action log; and

[. . .]

b. **Cooling Towers and Evaporative Condensers.** This section describes the preventative measures required for cooling towers and evaporative condensers that provide cooling, refrigeration, or both cooling and refrigeration for the *HVAC&R* systems or for other devices or systems in the building. The *legionellosis risk management plan* documents shall include identification of the responsible persons for every step of each *legionellosis risk management plan* requirement.

1. **System Maintenance.** The *legionellosis risk management plan* documents shall include:
   i. a schedule for inspections of ~~general~~ system cleanliness, drift eliminator condition, conditions of fill material, and water distribution system operation;
   ii. requirements and the schedule for basin or remote sump cleaning and purging of stagnant or low-flow zones; and
   iii. documentation requirements.
2. **Water Treatment.** The *legionellosis risk management plan* documents shall include the water treatment requirements to *control* microbiological activity, scale, and corrosion, and shall ~~also~~

[. . .]

5. **Location of Cooling Tower Makeup Valve.** The *legionellosis risk management plan* documents shall include requirements for the location of cooling tower makeup valves and for maintaining compliance with all applicable local, regional, and national codes and regulations for air gaps and backflow preventers and for the height of the discharge outlets and makeup valve over the rim of the overflow in the cooling tower or evaporative condenser cold water basins. If ~~no~~ such codes and regulation do not exist for the location, then the *legionellosis risk management plan* shall include requirements for maintaining compliance with ASME/ANSI A112.1.2[1] for air gaps and for maintaining compliance with codes and regulations applicable to other locations, selected by the owner or *designee*, for backflow preventers and for the height of the discharge outlets and makeup valve over the rim of the outflow in the cooling tower or evaporative condenser cold water basins.

[. . .]

d. **Ornamental Fountains and Open Water Features**

[. . .]

2. **Maintenance.** The *legionellosis risk management plan* documents shall include procedures for regular cleaning; for cleaning the visible buildup of dirt, organic matter, or other debris; and for maintain pumps and filters as ~~recommended~~ specified by the manufacturer.
3. **Water Treatment.** The *legionellosis risk management plan* documents shall include procedures for
   i. the weekly cleaning~~,~~ and *disinfection* of equipment and components~~,~~ and replacement of water in systems with total water volume <5 gal (20 L); or ~~for the periodic use of~~ when to apply a *disinfectant*, ~~the products to be applied, and a requirement to~~ following the *disinfectant* manufacturer's instructions~~directions~~;
   ii. ~~the~~ when to ~~periodic~~ apply ~~use of~~ a *disinfectant*, ~~the products to be applied, and a requirement to~~ following the *disinfectant* manufacturer's instructions~~directions~~ for systems ≥5 gal (20 L); and
   iii. maintaining water temperature within the *control limits* in the *legionellosis risk management plan*.

POLICY STATEMENT DEFINING ASHRAE'S CONCERN FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

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About ASHRAE

ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration, and sustainability. Through research, Standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow's built environment today.

For more information or to become a member of ASHRAE, visit www.ashrae.org.

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Visit the ASHRAE Bookstore

ASHRAE offers its Standards and Guidelines in print, as immediately downloadable PDFs, on CD-ROM, and via ASHRAE Digital Collections, which provides online access with automatic updates as well as historical versions of publications. Selected Standards and Guidelines are also offered in redline versions that indicate the changes made between the active Standard or Guideline and its previous version. For more information, visit the Standards and Guidelines section of the ASHRAE Bookstore at www.ashrae.org/bookstore.

IMPORTANT NOTICES ABOUT THIS STANDARD

To ensure that you have all of the approved addenda, errata, and interpretations for this Standard, visit www.ashrae.org/standards to download them free of charge.

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