ASHRAE Standard 514

A New Water Management Standard
How will this impact water system design and water management programs

Tuesday October 1st

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Session Agenda

- Waterborne Disease Outbreaks
- ASHRAE Standards 514 and 188
- Section 4 Compliance
- General Requirements
- Building Water Systems
- Design Requirements
- Health Care Requirements
- Appendices
- Question/Answers

Waterborne Disease Outbreaks

- Between 2015 and 2020
  - 28 states
  - 214 waterborne disease outbreaks
  - 2,140 incident diagnoses
  - 563 hospitalizations
  - 88 deaths

CDC MMWR Surveillance Summaries / March 14, 2024 / 73(1);1–23
https://www.cdc.gov/mmwr/volumes/73/ss/ss7301a1.htm

WHY TWO STANDARDS?

ASHRAE STANDARD

ANSI/ASHRAE Standard 514-2023

Risk Management for Building Water Systems: Physical, Chemical, and Microbial Hazards

Approved by the ASHRAE Standard Committee on June 24, 2023 and by the American National Standards Institute on July 25, 2023.

This Standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the Standard. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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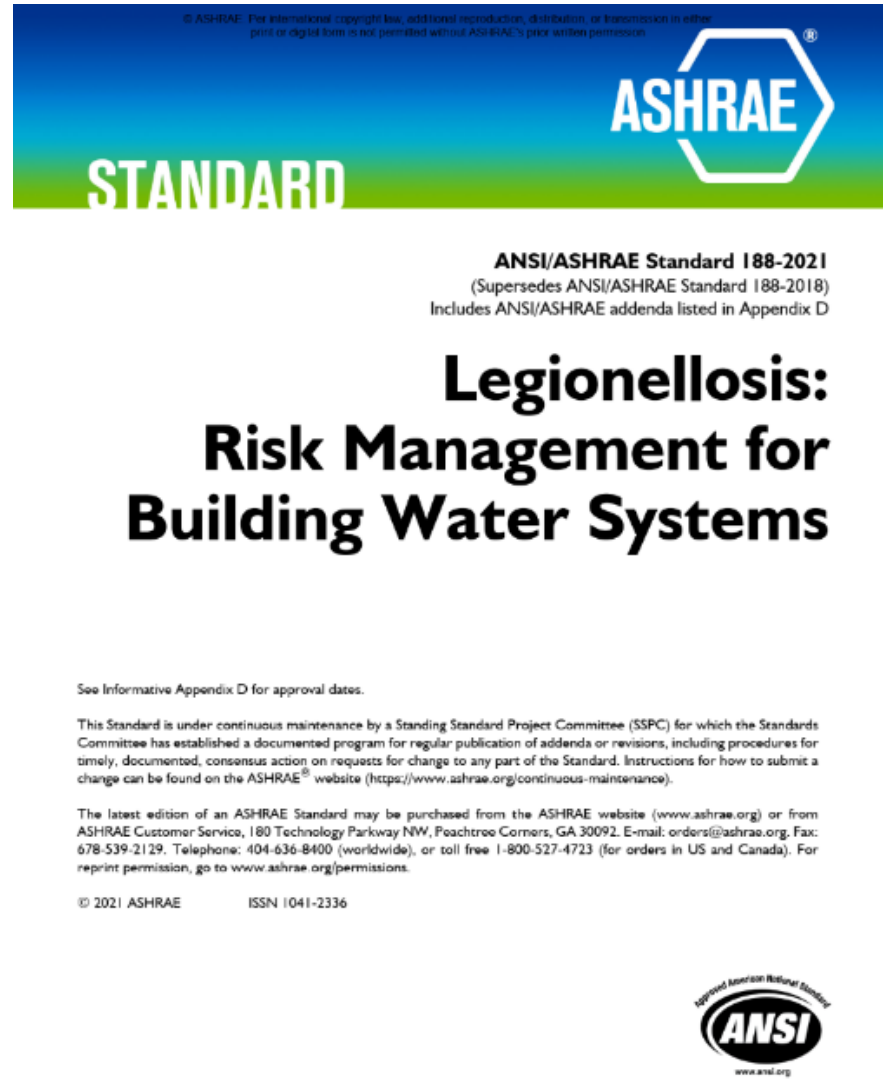

ASHRAE STANDARD

ANSI/ASHRAE Standard 188-2021
(Supersedes ANSI/ASHRAE Standard 188-2018)
Includes ANSI/ASHRAE addenda listed in Appendix D

Legionellosis: Risk Management for Building Water Systems

See Informative Appendix D for approval dates.

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Standard 514

- Developed to address concerns beyond legionella
- Addresses following hazards:
  - Physical
  - Chemical
  - Microbial
- Published 25 July 2023
- Legend for Slide Deck:
  - BLACK TEXT = In both
  - RED TEXT = Exclusive to 188
  - GREEN TEXT = Exclusive to 514

Standard 514

- Purpose
  - Establish minimum requirements:
    - Reduce illness and injury from physical, chemical, and microbial hazards from water systems in building
- Scope
  - New and Existing building water systems and components
  - Human-occupied Buildings:
    - Commercial
    - Institutional
    - Multiunit Residential
    - Assembly
    - Educational
    - Industrial

Section 4 - Compliance

- Does not require hazard analysis, risk assessment or risk management training or certification

- Requires compliance with 188
  - Coordinated and aligned with 188
  - Combined Standing Standard Project Committee 400

- Documentation
  - Physically or electronically on-site for review

Section 4 - Compliance

- Designer Requirements
  - Follow Section 7 (Section 5) if building water system has:
  - Systems:
    - Public pools or spas
    - Ornamental fountains
    - Misters, atomizers, air washers, humidifiers
  - Factors:
    - Includes multiple housing units
    - On-site supplemental disinfection
    - More than 6 (10) stories
    - Larger than 50,000 ft^2
    - Purposed to house under 2 or over 65
  - Health Care Facility

Section 4 - Compliance

- Health Care Factors:
  - Patient stays exceed 24 hours
  - Provides long-term residential health services
  - Contains one or more areas for
    - Surgery
    - Treatment for burns
    - Chemotherapy for cancer
    - Solid organ transplantation
    - Bone marrow transplantation
    - Occupants that are immuno-compromised
    - Taking drugs that weaken immune system
    - Have renal disease, diabetes or chronic lung disease

Section 4 - Compliance

- Building Owner Requirements
  - Survey to determine if applies
    - Before occupancy
    - Annually
  - Implement water management program

- Health Care Facility
  - Section 8
  - Normative Appendix A

General Requirements

188

PROGRAM TEAM—Identify persons responsible for Program development and implementation.

DESCRIBE WATER SYSTEMS/FLOW DIAGRAMS—Describe the potable and nonpotable water systems within the building and on the building site and develop water-system schematics.

ANALYSIS OF BUILDING WATER SYSTEMS—Conduct a systematic evaluation of *hazardous conditions* in the *building water system*, and determine where control measures shall be applied.

CONTROL MEASURES—Determine locations where control measures shall be applied and maintained in order to stay within established control limits.

MONITORING/CORRECTIVE ACTIONS—Establish procedures for monitoring whether control measures are operating within established limits and, if not, take corrective actions.

CONFIRMATION—Establish procedures to confirm the following:
- The Program is being implemented as designed—verification
- The Program controls the hazardous conditions throughout the building water system—validation

DOCUMENTATION—Establish documentation and communication procedures for all activities of the Program.

514

PROGRAM TEAM—Identify persons responsible for *Program* development and implementation.

DESCRIBE WATER SYSTEMS/FLOW DIAGRAMS—Describe the *potable* and *nonpotable water systems* within the building and on the building site, and develop water system schematics.

ANALYSIS OF BUILDING WATER SYSTEMS—Conduct a systematic evaluation of *hazardous conditions* in the *building water systems*, and determine where *control measures shall* be applied.

CONTROL MEASURES—Determine locations where *control measures shall* be applied and maintained to stay within established *control limits*.

MONITORING/CORRECTIVE ACTIONS—Establish procedures for *monitoring* whether *control measures* are operating within established limits, and if not, take *corrective actions*.

CONFIRMATION—Establish procedures to confirm the following:
- *Program* is being implemented as designed—*verification*.
- *Program controls* the *hazardous conditions* throughout the *building water systems*—*validation*.

DOCUMENTATION—Establish documentation and communication procedures for all activities of the *Program*.

Requirements for Building Water Systems

- Potable Water Systems
  - Start-up and Shutdown
  - System Maintenance
  - Water Treatment
  - Contingency Response Plan
  - Cooling Towers/Evaporative Coolers
  - Public Pools and Spas
  - Ornamental Fountains and Other Water Features
  - Aerosol-Generating Misters, Atomizers, Air Washers, and Humidifiers

Designing Building Water Systems

- Design Documents
  - System Overview
  - Construction Documents (Schematic diagrams)
  - Process flow diagrams (Monitoring and Control diagrams)
  - Compliance with codes/standards
  - Procedures for start-up
  - Location of:
    - Makeup
    - Flush
    - Sampling
    - Temperature monitoring
    - Drain
    - Outdoor intakes
  - Building water equipment
  - Commissioning

Designing Building Water Systems

- Design Documents
  - Operating instructions and procedures
  - Maintenance schedules, frequencies, and procedures
  - Location of sampling points
  - Incoming water quality report used for the basis of design
  - Design provisions that address hazardous conditions
  - No-flow and low-flow portions of piping
  - Impact of heat loss or gain
  - Cross connections
  - Access to expansion tanks, water hammer arrestors, water storage tanks, water heaters, and other equipment and components that contain water
  - Pipe size, length and flow
  - Flushing for dead legs
  - Dedicated sampling points

Designing Building Water Systems

- As-Built Documents
  - Locations of all points of connection
  - Location of each associated piece of equipment
  - Drawing of water distribution piping system
  - Location of outdoor air intakes
  - Equipment specifications
  - Applicable control systems
  - Safety Data Sheets for applicable materials
  - Installation requirements
  - Start-up requirements
  - Operational requirements
  - Maintenance procedures
  - Copy of required AHJ documentation for occupancy

Designing Building Water Systems

- Balancing
  - All water systems shall be balanced

- Start-up Procedures (Commissioning)
  - Procedures for testing of backflow assemblies
  - Procedures for balancing system
  - Confirmation system meets design parameters
  - Confirmation sensors communicating
  - Procedures for flushing and disinfection

Health Care Requirements

- Water Management Program
  - Program Development
  - Designated Team
  - Describe building water system (Water system flow diagram)
  - Process flow diagrams
  - Analysis of building water system (Risk Management Plan)
  - Control measures
  - Monitoring/Corrective Actions
  - Program Confirmation
  - Documentation and Communication
  - Existing buildings, new construction, renovation
  - Building water system procedures

Appendices

- Informative Appendix A – Building Water Systems Physical Hazards Guidance (Normative Health Care Facilities)
- Informative Appendix B - Building Water Systems Chemical Hazards Guidance (Informative Bibliography 514 App J)
- Informative Appendix C - Building Water Systems Microbial Hazards Guidance (Guidance if Legionella Testing is utilized in the Absence of Suspected or Confirmed Facility-Associated Disease)

Appendices

- Informative Appendix D – Guidance if Legionella Testing is utilized in the Absence of Suspected or Confirmed Facility-Associated Disease (Informative Addenda Description)
- Informative Appendix E – Potable and Process Building Water System Guidance
- Informative Appendix F - Building Designer Guidance
- Informative Appendix G – Health Care Facility Guidance

Appendices

- Informative Appendix H – Guidance for US Regulations on Drinking Water Treatment and on Chemicals used for Potable and Nonpotable Water Treatment

- Informative Appendix I - Guidance on Personal Protective Equipment for use when there is Potential for Exposure to Physical, Chemical and Microbial Hazards

Questions?

- **Thank you for attending!**
- Please remember to check in to the session and complete the evaluation to receive CEC.