WATERBORNE PATHOGENS

“IMPACT ON PATIENTS, VISITORS, AND STAFF WHO ENTER OUR FACILITIES”

PREPARED BY: GARY GIOVINAZZO CHFM, CHEP, CHSP, SASHE
PRESENTATION OVERVIEW

• TYPES OF WATERBORNE PATHOGENS
• WHY ALL THE RECENT CONCERN?
• WHO IS RESPONSIBLE?
• WATER SAFETY PLANS
• AT RISK SYSTEMS
• LEGIONELLA TESTING
• EQUIPMENT HOUSEKEEPING BEFORE AND AFTER EXAMPLES
• DOMESTIC POTABLE WATER TREATMENT
WHAT ARE WATERBORNE PATHOGENS?

There are many types; which are but not limited to:

- Legionella
- Mycobacteria
- Pseudomonas

The most common everyone is familiar with is the “L” word Legionella.
WATERBORNE PATHOGENS

• **OVERVIEW:** THERE HAVE BEEN SEVERAL OUTBREAKS ALL OVER THE COUNTRY, WHERE WATERBORNE PATHOGENS HAVE INFECTED PEOPLE. MOST OUTBREAKS ARE ASSOCIATED WITH THE BACTERIUM LEGIONELLA WHICH CAN CAUSE LEGIONNAIRES DISEASE (LD). THE INTENT IS TO HELP REDUCE AND MINIMIZE THE GROWTH AND PROLIFERATION OF WATERBORNE PATHOGENS INCLUDING LEGIONELLA IN YOUR FACILITIES. THE PROTECTION OF THE PATIENTS, VISITORS, AND STAFF IS PRIORITY ONE. LEGIONELLA MUST BE MANAGED. THIS IS ACHIEVED BY USING THE PROPER SYSTEMS, AND MAINTENANCE PROCEDURES TO MINIMIZE THE RISK. THE LEGIONELLA RISK CANNOT BE ELIMINATED, BUT CAN BE MANAGED. EACH FACILITY MAY HAVE A DIFFERENT RISK LEVEL THAN OTHER FACILITIES BASED ON THEIR PATIENT POPULATION BEING SERVED, CLINICAL SERVICES PROVIDED, AND THEIR TYPES OF SYSTEMS.
Cases of Legionnaires disease, a serious, often fatal form of pneumonia, nearly quadrupled from 2000 to 2014, according to a recent report from the U.S. Centers for Disease Control and Prevention (CDC.) Legionnaires disease is caused by species of Legionella bacteria, which are found naturally throughout the environment. These bacteria thrive in warm, stagnant water and can grow in the plumbing systems of large buildings such as hotels and hospitals as well as cruise ships. The bacteria can contaminate water sources such as hot tubs, drinking and bathing water, hot water tanks, air conditioning cooling towers, ice machines, humidifiers, and public fountains. People can contract Legionella by breathing in droplets of water that contain the bacteria. Legionella was first discovered after an outbreak in 1976 among people who attended an American Legion convention in Philadelphia. Of about 2,000 people who attended the convention, 221 contracted the disease and 34 died. Now, about 5,000 people contract Legionnaires disease each year, and one in ten dies, according to the CDC. Improved water disinfecting, better equipment, and better training of employees responsible for the disinfecting could have potentially prevented most of the Legionnaires disease outbreaks since 2000, according to the CDC report. "Better water system management is the best way to reduce illness and save lives..." said CDC Director Tom Friedan, M.D. M.P.H. Along with the report, CDC released a new toolkit to help building owners and managers prevent outbreaks of Legionnaires disease. According to the report, the most common source of recent Legionnaires disease outbreaks associated with buildings was potable (drinkable) water used for common purposes, such as showering. This was followed by cooling towers, hot tubs, and decorative fountains. While most healthy people don't develop Legionnaires disease after being exposed to Legionella, people who are more likely to develop the disease include those age 50 and older, current or former smokers, people with pre-existing lung disease, such as emphysema, and people with weakened immune systems. People at increased risk may choose to avoid potentially unsafe environments, such as hot tubs. They should seek medical care quickly if they develop symptoms of pneumonia and may be tested for Legionella. Besides those at risk, other individuals may be tested for Legionella if, for example, they have severe pneumonia and are in intensive care, have been treated with antibiotics and are still ill, or have pneumonia during a Legionella outbreak. Legionellabacteria are not susceptible to the commonly prescribed antibiotics used to treat respiratory infections. Therefore, it is important to perform additional laboratory testing to detect Legionella if the patient is not improving on the initially prescribed antibiotics. Common tests to check for Legionella include a urine test that detects a protein produced by Legionella bacteria and testing performed on sputum samples (deep respiratory secretions), which require the person being tested to cough up secretions (phlegm) from the lungs.
ASSEMBLY, No. 1657

STATE OF NEW JERSEY

218th LEGISLATURE

PRE-FILED FOR INTRODUCTION IN THE 2018 SESSION

Sponsored by:
Assemblywoman ELIANA PINTOR MARIN
District 29 (Essex)
Assemblywoman ANNETTE QUIJANO
District 20 (Union)

SYNOPSIS
Requires registration, inspection, testing, cleaning, and disinfection of cooling towers to control outbreaks of Legionnaire’s Disease.

CURRENT VERSION OF TEXT
Introduced Pending Technical Review by Legislative Counsel.
WHO IS RESPONSIBLE TO PROTECT THE PATIENTS, VISITORS, AND STAFF FROM WATERBORNE PATHOGENS?

• THIS IS A TEAM APPROACH THAT MAY INCLUDE THE FOLLOWING STAFF AND OR DEPARTMENTS:

• FACILITIES MANAGEMENT, INFECTION CONTROL TEAM, CLINICIANS, SAFETY, HOSPITAL SENIOR ADMINISTRATION, AND THE FACILITIES WATER MANAGEMENT VENDOR. THIS WOULD MAKE UP THE “WATER MANAGEMENT SAFETY TEAM” (WMST)
WHAT IS THE WATER MANAGEMENT SAFETY TEAM’S RESPONSIBILITY?

- The team is responsible for minimizing and reducing the risk for waterborne pathogen exposure to patients, visitors and staff who enter the facility.
HOW DOES THE TEAM HELP REDUCE THE RISK OF WATERBORNE PATHOGEN EXPOSURE?

• THE TEAM SHOULD MEET WITH THE FACILITIES WATER TREATMENT CONTRACTOR TO DEVELOP A WATER SAFETY PLAN (WSP)

• THIS PLAN SHOULD INCLUDE:
  1) ENVIRONMENTAL ASSESSMENT OF THE BUILDING WATER SYSTEMS
  2) MONITORING & CONTROL PLAN
  3) PLAN GUIDELINE
  4) PLAN CONFIRMATION
WATER SAFETY PLAN ASSESSMENT

• ENVIRONMENTAL ASSESSMENT OF THE BUILDING WATER SYSTEMS: THIS SHOULD EVALUATE CURRENT PRACTICES AGAINST RECOMMENDED INDUSTRY BEST PRACTICE. HOW IS THIS ACHIEVED?

START WITH A COMPLETE INVENTORY OF ALL OF THE BUILDING WATER SYSTEMS THESE INCLUDE BUT MAY NOT BE LIMITED TO: DOMESTIC WATER SYSTEMS (HOT & COLD), COOLING SYSTEMS, AND OTHER SYSTEMS THAT MAY BE A RISK
ONCE THE TEAM HAS AGREED ON THE SYSTEMS, THE TEAM WILL WORK WITH THE WATER TREATMENT VENDOR TO ESTABLISH LOCATIONS, CONTROL MEASURES, MONITORING FREQUENCIES, CONTROL LIMITS, AND CONTINGENCY RESPONSES.
WATER SAFETY PLAN GUIDELINES

• THE GUIDELINES WILL PROVIDE SPECIFIC INSTRUCTIONS FOR THE TEAM TO IMPLEMENT THE PROGRAM, ESTABLISH BEST PRACTICES FOR CONTROLLING THE RISK, AND RESPONSE PLANS WHEN LIMITS ARE NOT MET.
WATER SAFETY PLAN
CONFIRMATION

• THIS CONFIRMATION IS ACHIEVED BY UTILIZING ESTABLISHED CHECKLISTS TO BE USED BY THE TEAM WHEN VALIDATING CERTAIN SPECIFIC CONTROL POINTS. ALL DOCUMENTATION SHOULD BE KEPT ON FILE THAT CAN BE ACCESSED WHEN REQUESTED.
WATER SAFETY PLAN
WHAT ARE THE STANDARDS WE NEED TO FOLLOW?

• START WITH ASHRAE 188 ADOPTED JUNE 26, 2015. THIS HAS SPECIFIC GUIDELINES FOR ALL BUILDINGS AND ADDITIONAL SECTIONS FOR HEALTHCARE

• CMS S&C LETTER 17-30 DATED JUNE 2, 2017 “REQUIREMENT TO REDUCE LEGIONELLA RISK IN HEALTHCARE FACILITIES WATER SYSTEMS TO PREVENT CASES AND OUTBREAKS OF LEGIONNAIRES DISEASE”

• CENTERS OF DISEASE CONTROL AND PREVENTION ON JUNE 5, 2017. (CDC TOOL KIT): “DEVELOPING A WATER MANAGEMENT PROGRAM TO REDUCE LEGIONELLA GROWTH & SPREAD IN BUILDINGS”

• FOLLOW YOUR STATE DEPARTMENT OF HEALTH REGULATIONS AND GUIDELINES

• INDUSTRY BEST PRACTICES
Legionellosis: Risk Management for Building Water Systems
WATER SAFETY PLAN
ASHRAE 188

• This is the standard that many state department of Health's follow, when setting up state regulations and also some local cities and towns follow. The standards are for all buildings, the sections that are health care specific are sections 4.3, 6, 7, and normative annex “A” health care facilities.

• Also research with your local AHJ for additional requirements.
DATE: June 02, 2017

TO: State Survey Agency Directors

FROM: Director
Survey and Certification Group

SUBJECT: Requirement to Reduce Legionella Risk in Healthcare Facility Water Systems to Prevent Cases and Outbreaks of Legionnaires’ Disease (LD)

Memorandum Summary

- **Legionella Infections:** The bacterium Legionella can cause a serious type of pneumonia called LD in persons at risk. Those at risk include persons who are at least 50 years old, smokers, or those with underlying medical conditions such as chronic lung disease or immunosuppression. Outbreaks have been linked to poorly maintained water systems in buildings with large or complex water systems including hospitals and long-term care facilities. Transmission can occur via aerosols from devices such as showerheads, cooling towers, hot tubs, and decorative fountains.

- **Facility Requirements to Prevent Legionella Infections:** Facilities must develop and adhere to policies and procedures that inhibit microbial growth in building water systems that reduce the risk of growth and spread of *legionella* and other opportunistic pathogens in water.

Background

LD, a severe sometimes fatal pneumonia, can occur in persons who inhale aerosolized droplets of water contaminated with the bacterium *Legionella*. In a recent review of LD outbreaks in the United States occurring in 2000–2014, 19% of outbreaks were associated with long-term care facilities and 15% with hospitals. The rate of reported cases of legionellosis, which comprises both LD and Pontiac fever (a milder, self-limited, influenza-like illness) has increased 285% in the US during 2000–2014, with approximately 5,000 cases reported to the Centers for Disease Control and Prevention (CDC) in 2014. Approximately 9% of reported legionellosis cases are fatal. The Centers for Medicare & Medicaid Service (CMS) is aware of multiple recent LD outbreaks in hospitals and long-term care facilities as reported by the CDC, state and local health departments, or investigated by State Survey Agencies (SA).

Outbreaks generally are linked to environmental reservoirs in large or complex water systems, including those found in healthcare facilities such as hospitals and long-term care facilities. Transmission from these water systems to humans requires aerosol generation, as can occur from
Developing a Water Management Program to Reduce *Legionella* Growth & Spread in Buildings

A PRACTICAL GUIDE TO IMPLEMENTING INDUSTRY STANDARDS
WATER SAFETY PLAN
WHAT SHOULD I BE CONCERNED ABOUT

• DOMESTIC WATER SYSTEMS
• COOLING SYSTEMS
• OTHER “AT RISK” SYSTEMS
WATER SAFETY PLAN
DOMESTIC WATER SYSTEMS

SOME OF THESE SYSTEMS ARE BUT NOT LIMITED TO ARE:

• DOMESTIC COLD WATER SUPPLY SURGE TANK
• DOMESTIC COLD WATER SUPPLY TANK (HOUSE TANK)
• DOMESTIC HOT WATER STORAGE TANK
• DOMESTIC WATER SINKS, SHOWERS, AND RELATED EQUIPMENT
WATER SAFETY PLAN
COOLING SYSTEMS

SOME OF THESE SYSTEMS ARE BUT NOT LIMITED TO ARE:

• COOLING TOWERS
• AIR HANDLING UNITS
• HUMIDIFIERS
WATER SAFETY PLAN
OTHER “AT RISK” SYSTEMS

SOME OF THESE SYSTEMS ARE BUT NOT LIMITED TO ARE:

- EYEWASH STATIONS / EMERGENCY SHOWERS
- FIRE SPRINKLER SYSTEMS
- ICE MACHINES
- DRINKING WATER FOUNTAINS
- CIRCULATING BATH TUBS
- DECORATIVE WATER FOUNTAINS / WATER CURTAIN WALLS
WATER SAFETY PLAN
OTHER “AT RISK” SYSTEMS

SOME OF THESE SYSTEMS ARE BUT NOT LIMITED TO ARE:

• IRRIGATION EQUIPMENT
• POOLS AND SPAS
• RESPIRATORY CARE EQUIPMENT
COOLING TOWER BACTERIA MONITORING

Allows for convenient measurement & consistent monitoring of general microbial activity.
Total viable counts – colony forming units/ml
Determines if within microbiological control or if an increased risk and required action.

Cooling tower waters must be tested weekly for microbial activity using dip slides.
If control strategy is effective, dip slide counts should reflect this, indicating consistently low (<10,000 CFU/ml).
Consistent high microbial counts; cross check by a competent lab, look to root cause, biocide working, contamination etc?

Take corrective action
Weekly Dip Slides
LEGIONELLA TESTING - Culture Method

Culture enumeration is the gold standard only if done by an accredited lab
Independent certification / accreditation Legionella ISO 11731 and 11731-2

Be Aware That:
• Sample to lab receipt times affects enumeration, aim for max 24 hours
• Labs can report legionella in cfu/litre or cfu/ml – check the units
• Labs can have widely different limits of detection (LOD)
  eg 999 cfu/ Litre (0.999 cfu/ml) would be stated as not detected if lab
  has LOD of 1000 cfu/ Litre (1.0 cfu/ml)
• Action values start from 100 cfu/Litre (0.1 cfu/ml) so a LOD of 100 cfu/Litre (0.1 cfu/ml) is required
• Overgrowth of general bacteria (high TVCs) on a culture plate can hide the presence of legionella,
  can lead to a ‘not detected’ statement
WATER SAFETY PLAN
DOMESTIC WATER SYSTEMS MAINTENANCE

• ANNUAL CLEANING OF DOMESTIC WATER TANKS (HOT AND COLD) AND TESTING FOR BACTERIA CULTURES.

• ROUTINE FLUSHING OF STAGNATE SYSTEMS

• PROPER WATER TEMPERATURE CONTROL OF DOMESTIC HOT WATER SYSTEMS MAINTAIN AS HIGH A TEMPERATURE AS POSSIBLE
WATER SAFETY PLAN
COOLING SYSTEMS MAINTENANCE

COOLING TOWERS:

• PRE SEASON CLEANING AND DISINFECTION
• MID SEASON ON-LINE DISINFECTION
• POST SEASON CLEANING AND DISINFECTION
• PROPER BIOCIDE APPLICATION
• ADDITIONAL CHECKS AS OUTLINED IN YOUR PLAN (DAILY, MONTHLY, SEMI-ANNUAL, AND ANNUAL)
# Cooling Tower Preventive Maintenance Schedule

<table>
<thead>
<tr>
<th>Maintenance Service</th>
<th>Daily</th>
<th>Monthly</th>
<th>Quarterly</th>
<th>Semi-annually/Season Startup or Annually</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect General Condition and Operation</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Observe Operation of:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanical-motor, fan and drive mechanism</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Makeup valve (if equipped)</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Inspect for unusual noise or vibration or oil leaks</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Inspect and Clean:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air inlet</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Drift eliminators</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Distribution basin and collection basin</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Nozzles-missing, broken, or plugged</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Fan motor exterior</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td><strong>Check:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biocide Feed Pump Operation</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Collection water basin level</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Blowdown-adjust as required</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Geareducer Driver (if equipped):</strong></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Check for loose fasteners including oil drain plug</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Check for / repair oil leaks</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Check oil level</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td><strong>Lube Lines (If equipped):</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check for oil leaks in hoses or fittings</td>
<td></td>
<td>x</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td><strong>Belt drive (if equipped):</strong></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Fan shaft bearing lubrication (every 3 mo.)</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Check and tighten support fasteners</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Check shaft, sheave and belt alignment</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Check belt tension and condition</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Check sheave bushing fastener torque</td>
<td>x</td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
# Daily Cooling Tower Inspection Checklist

<table>
<thead>
<tr>
<th>Date Inspected:</th>
<th>Hospital Name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspected by:</td>
<td>Location:</td>
</tr>
<tr>
<td>Manufacturer:</td>
<td>Hospital's Tower Designation:</td>
</tr>
<tr>
<td>Model No.:</td>
<td>Serial No.:</td>
</tr>
<tr>
<td>Operation:</td>
<td>Process Served By Tower:</td>
</tr>
<tr>
<td></td>
<td>Continuous ☐</td>
</tr>
<tr>
<td>No. of Fan Cells:</td>
<td></td>
</tr>
</tbody>
</table>

Inspect General Condition and Operation of the Following Features:

<table>
<thead>
<tr>
<th>Inspection/Operation Of:</th>
<th>CONDITION/COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical-motor, fan and drive mechanism</td>
<td></td>
</tr>
<tr>
<td>Inspect for unusual noise or vibration or oil leaks</td>
<td></td>
</tr>
<tr>
<td>Makeup valve (if equipped)</td>
<td></td>
</tr>
<tr>
<td>Collection water basin level</td>
<td></td>
</tr>
<tr>
<td>Blow down / adjust as required</td>
<td></td>
</tr>
<tr>
<td>Biocide feed pump operation</td>
<td></td>
</tr>
<tr>
<td>Condenser water pump (On/Off)(✓)</td>
<td>ON:</td>
</tr>
<tr>
<td></td>
<td>OFF:</td>
</tr>
<tr>
<td>If CWP “Off” indicated above, run for a minimum of 30 minutes [with biocide]</td>
<td>Start Time:</td>
</tr>
<tr>
<td></td>
<td>End Time:</td>
</tr>
<tr>
<td></td>
<td>Total Time Run:</td>
</tr>
</tbody>
</table>

Condition of the Feature: Using the key below, apply the Number that best describes the condition of each item.

<table>
<thead>
<tr>
<th>Key</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Good</td>
</tr>
<tr>
<td>2</td>
<td>Keep an eye on it</td>
</tr>
<tr>
<td>3</td>
<td>Needs immediate attention</td>
</tr>
<tr>
<td>N/A</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>
## Cooling Tower Inspection Checklist

**Frequency (Circle One):**  Monthly  Quarterly  Semi-Annual  Annual

<table>
<thead>
<tr>
<th>Date Inspected</th>
<th>Hospital Name</th>
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<tr>
<td>Inspected by:</td>
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</tr>
<tr>
<td>Manufacturer:</td>
<td>Hospital’s Tower Designation:</td>
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<tr>
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<td>Manufacturer:</td>
<td>Hospital’s Tower Designation:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model No.:</th>
<th>Serial No.:</th>
<th>Process Served By Tower:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Operation:</th>
<th>Continuous ☐  Intermittent ☐  Seasonal ☐</th>
<th>No. of Fan Cells:</th>
</tr>
</thead>
</table>

### Gear Drive Units
- Manufacturer: ___________________  Model No.: ________  Serial No.: ________
- Oil Level: ☐ Full  ☐ Low  ☐ Add Immediately
- Oil Type Used: ___________________
- Oil Condition: ☐ Good  ☐ Contains Water  ☐ Contains Metal  ☐ Contains Sludge
- Any Unusual Noises?: ☐ Yes  ☐ No  Action Required: ___________________

### Drive Shafts
- Coupling aligned ☐ Yes ☐ No
- Coupling fasteners tight ☐ Yes ☐ No
- Unusual Wear ☐ Yes ☐ No

### Belt Drive Units
- Fan Shaft Bearing Lubricated ☐ Yes ☐ No
- Support Fasteners Tight ☐ Yes ☐ No
- Belt Tension Checked ☐ Yes ☐ No
- Shaft Sheave and belt aligned ☐ Yes ☐ No
- Sheave, bushing, fastener torqued ☐ Yes ☐ No
- Any Unusual Noises?: ☐ Yes  ☐ No

### Fans
- □ Fixed Pitch  □ Adjustable Pitch  Diameter ________  Number of Blades ________

### Motor
- Last Lubrication Date: ________  Grease Type: ________
- Name Plate Data: HP ________  RPM ________  Phase ________  Hz ________  Volts ________  F.L. Amps ________
- Frame ________  S.F. ________  Special Info: ___________________
- Any Unusual Noise: ☐ Yes  ☐ No  Action Required: ___________________
- Any Unusual Vibration: ☐ Yes  ☐ No  Action Required: ___________________
- Any Unusual Heat Build-up: ☐ Yes  ☐ No  Action Required: ___________________
COOLING TOWER EXAMPLES
EXTREMELY FOULED COOLING TOWER
BEFORE & AFTER
BEFORE & AFTER
WATER SAFETY PLAN
OTHER “AT RISK” SYSTEMS MAINTENANCE

• EYEWASH STATIONS AND EMERGENCY SHOWERS: WEEKLY TESTING AND FLUSHING

• FIRE SPRINKLER SYSTEMS: REQUIRED TESTING AS PER NFPA 25 WHICH INCLUDES 5 YEAR SPRINKLER OBSTRUCTION INVESTIGATION

• ICE MACHINES: FOLLOW MANUFACTURERS RECOMMENDATION ON CLEANING AND DISINFECTION (MOSTLY QUARTERLY CLEANING AND DISINFECTION)

• DRINKING WATER FOUNTAINS: TEMPERATURE CHECKS, AND FLOWING OF WATER
ICE MACHINE EXAMPLES
BEFORE & AFTER
BEFORE & AFTER
BEFORE & AFTER
BEFORE & AFTER
WATER SAFETY PLAN
OTHER “AT RISK” SYSTEMS MAINTENANCE

• CIRCULATING BATHTUBS, HYDRO THERAPY TUBS: CLEAN AND DISINFECT AS PER FACILITY INFECTION CONTROL POLICY

• DECORATIVE FOUNTAINS / WATER CURTAINS: TRY TO ELIMINATE. IF NOT WORK WITH THE WATER TREATMENT VENDOR TO MAINTAIN THE SYSTEMS.

• IRRIGATION SYSTEMS: FOLLOW THE WATER MANAGEMENT PLAN

• POOLS AND SPAS: FOLLOW THE WATER MANAGEMENT PLAN

• RESPIRATORY CARE EQUIPMENT: FOLLOW THE INFECTION CONTROL PRACTICES AND POLICIES FOR EACH FACILITY
WATER SAFETY PLAN ANNUAL REVIEW

• THE PLAN MUST BE REVIEWED ANNUALLY TO INSURE ANY UPDATES BE INCLUDED INTO THE PLAN

• THE PLAN MUST BE REVIEWED TO INCLUDE ANY CHANGES IN EQUIPMENT, REMOVED EQUIPMENT, ADDITIONAL NEW EQUIPMENT, AND ANY BUILDING INFRASTRUCTURE RENOVATIONS / NEW CONSTRUCTION TO BE INCLUDED INTO THE PLAN

• INCLUDE ANY NEW REGULATORY CHANGES THAT MAY IMPACT IMPLEMENTING THE PLAN.
WATER SAFETY PLAN

• WHAT HAPPENS IF WE HAVE PROBLEMS WITH THE WATER SYSTEMS WITHIN THE FACILITIES (WATERBORNE PATHOGENS)?

• WHAT MEASURES CAN BE TAKEN TO REDUCE OR ELIMINATE THE RISK?

• ARE THERE ANY MECHANICAL DEVICES THAT CAN HELP?
WATER SAFETY PLAN
WHAT TO DO WHEN RISKS ARE IDENTIFIED IN THE WATER SYSTEMS

• AFTER MEETING WITH THE WMST AND SELECTING A PLAN OF ACTION. BE SURE TO DOCUMENT ALL OF THE PROCEDURES AND ACTION ITEMS.

• EACH OPTION HAS IT'S PROS AND CONS.
WATER SAFETY PLAN
WHAT TO DO WHEN RISKS ARE IDENTIFIED IN THE WATER SYSTEMS

• FOLLOW YOUR PLAN ! FOLLOW THE PLAN ! FOLLOW THE PLAN !

• MEET WITH THE WATER MANAGEMENT SAFETY TEAM AND THE REVIEW THE OPTIONS.

• MANY OPTIONS CAN BE IMPLEMENTED, BUT WITH THE TEAM SEE HOW THIS WILL IMPACT THE PATIENTS, VISITORS AND STAFF OF YOUR FACILITY.

• SOME OPTIONS ARE BUT NOT LIMITED TO; FLUSHING THE SYSTEM, SUPERHEATING THE SYSTEM, HYPER CHLORINATION, AND POSSIBLY INSTALLING A SECONDARY DISINFECTION SYSTEM.
WATER SAFETY PLAN
WHAT TO DO WHEN RISKS ARE IDENTIFIED IN THE WATER SYSTEMS
WHAT ARE THE OPTIONS AND HOW WILL THEY IMPACT FACILITY OPERATIONS

• SUPER HEATING: THIS REQUIRES THE WATER TEMPERATURE TO BE SUPERHEATED TO 160 DEGREES AND DISTRIBUTED TO ALL OF THE DISTILLATE POINTS TO KILL THE WATERBORNE PATHOGENS (AS OUTLINED IN YOUR PLAN). THIS PROCESS MUST BE WELL PLANNED OUT SO THE PATIENTS, VISITORS AND STAFF ARE SAFE FROM BEING SCALDED.

• HYPER-CHLORINATION: THIS PROCESS INTRODUCES HIGHER THAN NORMAL LEVELS OF CHLORINE INTO THE SYSTEM. THE LEVEL OF CHLORINE MUST BE MEASURED AND FLOWED AT EACH DISTILLATE POINT FOR A PERIOD OF TIME (AS OUTLINED IN YOUR PLAN) THEN FLUSH WITH NORMAL DOMESTIC WATER UNTIL THE CHLORINE LEVELS REACH DESIRED RANGE.
WATER SAFETY PLAN
WHAT TO DO WHEN RISKS ARE IDENTIFIED IN THE WATER SYSTEMS
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• FLUSHING THE SYSTEM: SOMETIMES THIS IS THE FIRST APPROACH TO GET THE FLOW OF THE RESIDUAL CHLORINE THAT IS IN THE DOMESTIC WATER TO THE POINTS WHERE LOW FLOW IS OCCURRING. THE CHLORINE IN THE WATER SHOULD KILL THE WATERBORNE PATHOGENS. (IF AT DESIRED LEVELS)

• SECONDARY DISINFECTION SYSTEMS: THE PREVIOUS THREE OPTIONS (SUPERHEATING, HYPER-CHLORINATION, AND SYSTEM FLUSHING) ARE SHORT TERM SOLUTIONS. A SECONDARY DISINFECTION SYSTEM CAN BE A MORE LONG TERM STRATEGY TO MINIMIZING THE GROWTH OF WATERBORNE PATHOGENS. NOTHING IS 100%, THE SYSTEMS MUST BE MONITORED AND MAINTAINED TO REDUCE THE POTENTIAL GROWTH OF THE WATERBORNE PATHOGENS.
WATER SAFETY PLAN

WHAT TO DO WHEN RISKS ARE IDENTIFIED IN THE WATER SYSTEMS

WHAT ARE THE OPTIONS FOR SECONDARY DISINFECTION SYSTEMS

The below most commonly used systems are not in any specific order of effectiveness

- Chlorine Bleach Injection
- Chlorine Dioxide
- Monochloramine
- Copper Silver Ionization
- E-Chlor Chlorine
- With any of the above options proper dosage control is paramount
WATER SAFETY PLAN
WHAT TO DO WHEN RISKS ARE IDENTIFIED IN THE WATER SYSTEMS
WHAT IS THE BEST CHOICE FOR SECONDARY DISINFECTION SYSTEMS

THE ANSWER IS, THERE IS NO BEST CHOICE. EVERY SYSTEM HAS IT'S PROS AND CONS. EACH FACILITY HAS UNIQUE INFRASTRUCTURE DESIGNS THAT MAY ELIMINATE CERTAIN OPTIONS. THE DOMESTIC WATER BEING SUPPLIED TO THE FACILITY BY LOCAL AGENCIES MAY DIFFER AND HAS MORE OR LESS PRIMARY DISINFECTION CHEMICALS ADDED PRIOR TO GETTING TO THE FACILITY. THAT IS WHY THIS IS A TEAM DECISION AND MUST INCLUDE YOUR WATER MANAGEMENT SAFETY TEAM (WMST) AS WELL AS YOUR WATER TREATMENT VENDOR.
HEALTHCARE-ASSOCIATED LEGIONELLA CASES ACCOUNTED FOR 85% OF THE OUTBREAK-ASSOCIATED DEATHS IN A SERIES OF 27 CDC INVESTIGATIONS, 2000-2014
The findings from the 27 CDC outbreak investigations from 2000-2014:
1/3 were healthcare-associated outbreaks
56% involved contamination of the potable water, 22% involved the cooling towers

85% of the outbreak were gaps in basic water management: 70% with inadequate disinfection and 52% with inappropriate temperatures
LEGIONELLA RISK IN LONG-TERM CARE FACILITIES

RESIDENTS IN LTCFS HAVE RISK FACTORS FOR LEGIONNAIRE’S DISEASE:
- AGE > 50
- CHRONIC LUNG CONDITIONS (EMPHYSEMA)
- CONDITIONS IMPACTING IMMUNE RESPONSE (FRAILTY, DIABETES)
- TAKING IMMUNOSUPPRESSING MEDICATION
WATERBORNE PATHOGENS

QUESTIONS ?