

**University Health, Safety and Environment Services**

**Guidance for Managing Legionella Risk in School, Faculty, and Department Water Systems and Equipment**

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## 1. Introduction

[The Control of Substances Hazardous to Health Regulations 2002](#) set out the general responsibilities on employers to manage the risks from any substance, including biological agents, which are hazardous to health.

Exposure to the bacterium legionella pneumophila, or to related bacteria can cause a range of illnesses which are collectively known as Legionellosis. The most serious of these diseases is Legionnaires' disease. This is normally contracted by inhaling legionella bacteria, either in tiny droplets of water (aerosols), or in droplet nuclei (the particles of water left after the water has evaporated) contaminated with legionella, deep into the lungs. This disease can affect anybody but certain groups, such as smokers, people over 45, people with chronic health conditions (e.g. with impaired liver and/or kidney function) or people that are immunosuppressed, are most susceptible. In extreme cases, legionnaire's disease can be fatal and there are numerous cases of outbreaks in local communities, which can be linked back to a single source, that have resulted in multiple fatalities.

The risks associated with legionella bacteria can be managed by the introduction of control measures that reduce:

- The likelihood of legionella growth and proliferation in water systems; and
- So far as is reasonably practicable, the likelihood of exposure of people to water droplets and/or aerosols from water based systems and work activities.

The Health and Safety Executive (HSE) has produced [detailed guidance on how the risks of legionella should be managed in hot and cold water systems](#) and a three-part [Technical Guidance](#) on the management of the risks associated with other types of systems and equipment.

## 2. University Legionella Management Policy

The University's Legionella Management Policy sets out how the University will manage legionella risks in accordance with the COSHH regulations and the associated guidance. The Director of Estates is named as the Duty-Holder for managing legionella risks in University owned and/or managed hot and cold water systems. However, where there are legionella risks associated with work activities and systems and equipment which are owned and managed by Schools or Faculties or Departments or Directorates, then the relevant Dean, Head of Department or Director will be the duty holder responsible for managing these legionella risks. This guidance, which is based on [Legionnaires' disease: Technical guidance Part 3: The control of legionella bacteria in other risk systems](#), sets out a five- step approach that School, Faculty, Departmental and Directorate duty-holders should take to ensure that they are meeting their responsibilities under that policy.

## 3. Guidance for Duty-Holders

### 3.1 Appoint Nominated Persons to assist the Duty-Holder

The duty-holder is responsible for the overall management of legionella risks for water systems and activities that fall under their control. They may want to nominate

one or more of their reports to assist them with the management of relevant activities, such as identifying in-scope systems and equipment, carrying out risk assessments and implementing and monitoring written schemes of work.

People nominated to undertake this role need to have access to all equipment and areas within the duty-holders control. They will also need the necessary competence to understand what equipment, systems or processes pose a reasonably foreseeable risk. Advice on training is available from the University's Health, Safety and Environment (UHSE) Service.

Alternatively, duty-holders may want to engage a specialist contractor, for example by arrangement with their Technical Services Directorate and/or Estates, to undertake the risk assessment process (and subsequent development of control measures and written schemes) on their behalf.

**All such nominations or appointments should be made in writing.** If no such nominations or appointments are made then it will be assumed that the Duty-Holder will be retaining the day-to-day responsibility for the management of these tasks.

### **3.2 Assess the Risks.**

The HSE consider that there is a reasonably foreseeable risk of legionella exposure if one or more of the following factors apply:

- Legionella bacteria is present in the system, either naturally from the incoming water supply or as a result of external contamination;
- Water temperatures of between 20-45°C are present in some or all of the system at any time;
- Water is stored or re-circulated;
- Deposits and materials (including rusts, sludge, biofilms, scale, organic matter, dusts) that may provide a source of nutrients to support bacterial growth are, or could be, present in the system (either due to contamination or as a natural part of a process);
- The system provides a means of creating and spreading breathable droplets (aerosols);
- There are susceptible people who may be exposed to those aerosols.

The department will need to identify all equipment where water is either used or stored. An assessment will then need to be made of each piece of equipment to identify whether one or more of the risk factors are present.

The following list provides an idea of the types of systems that may present a foreseeable risk of legionella exposure. These include, **but are not limited to:**

- Water baths;
- Washing machines with water sump tanks;
- ultrasonic humidifiers/foggers;
- spray and/or misting humidifiers and devices;
- air washers, wet scrubbers, particle and trivial gas scrubbers;

- water softeners;
- emergency showers, eyebaths and face wash fountains;
- sprinkler and hose reel systems;
- spa pools and whirlpool baths;
- horticultural misting systems;
- vehicle washers including automatic washers for cars, buses, lorries and railway rolling stock;
- powered dental equipment;
- fountains and decorative water features;
- non-disposable nebulisers used for respiratory therapy;
- irrigation systems;
- fire, dust and odour suppression systems.

It is stressed that the above list is **not exhaustive**; there may be other equipment that the duty-holder is responsible for, such as certain research equipment where water is held and recirculated or which generates some sort of spray, where there is a reasonably foreseeable risk of legionella exposure.

### 3.3 Controlling the Risks

A written record should be made of all identified “at risk” equipment. This record should include details of the risk factors associated with each system or process. The assessment should consider all possible uses and risks associated with the equipment; in some cases a system may be safe during normal operation by virtue of being fully enclosed. However, maintenance activities may mean that once enclosed water sources are now accessible, which may increase the risk of exposure to legionella; this additional risk should be considered within the assessment.

If an assessment of a water system concludes that none of the risk factors apply then no further action is required other than to record this finding and to include the equipment in any subsequent reviews.

Where risks are identified, then the assessor should initially consider whether that risk can be eliminated by using equipment that does not require the use and/or storage of water. For example, if the water is required for cooling, then it may be that other means of cooling, such as air cooling, may be viable. If it is not reasonably practicable to eliminate the risk, then a written schedule of measures to control the risks posed by each piece of equipment needs to be devised and implemented. The extent and complexity of any required control measures will vary from system to system depending on the level of risk.

Control measures could include:

- Taking steps to prevent the release of water spray (for example, by enclosing the process);
- Avoiding water temperatures and conditions that favour the growth of legionella and other microorganisms;

- Keeping systems in good repair (for example by making sure that tank lids are fitted) to avoid contamination with nutrients;
- Periodically descale equipment where scaling may be an issue;
- Making sure that water cannot stagnate anywhere in the equipment by keeping any pipework as short as possible, ensuring good (and regular) flow through the equipment (for example by regularly flushing outlets for at least two minutes), and draining the equipment when not in use;
- Reducing risks by managing how water is used in the system. For example, it is better, from a legionella management perspective, to have a single pass system than to continuously recirculate water. However, this approach does have cost and energy implications: if water does have to be recirculated, then it may at least be possible to reduce the number of passes and to replace the water regularly (for example, every day);
- Keep the equipment and the water in it clean. This could include chemically treating the water to either kill legionella (and other micro-organisms) or to inhibit their ability to grow. Alternatively, other control measures such as the use of heat to pasteurise the system or UV lights may be considered.

The HSE has produced a schedule of risk control measures and inspections for specific types of systems where there is a foreseeable risk of legionella exposure. This is reproduced in Appendix 1. Again, it needs to be noted that this is not a definitive list of all control measures; local risk assessments still need to identify appropriate control measures that will be used for specific pieces of equipment or systems.

### **3.4 Implement, Manage and Monitor Precautions**

The management controls for implementing and monitoring of the precautions can be part of the normal School safety management arrangements. This could include, for example, regular reporting of legionella risk assessment, compliance and maintenance activities by the Nominated Person (or any external contractor engaged to undertake this role) at the Departmental Health and Safety Committee, inclusion of checks of records on departmental or Faculty inspections and physical checks of water systems on safety inspections.

### **3.5 Keep records of the following**

Duty-holders should ensure that up to date records are kept of each of the following:

- Names and positions of nominated persons responsible for each item of equipment or systems identified as a possible source of legionella;
- Risk assessments;
- The control measures implemented;
- Annual, monthly, weekly records of inspection, maintenance, remedial measures, disinfection, cleaning, shut downs. If a biocide is used records should be kept of all tests carried out, together with the results of the tests, and details of any changes made to the biocide level.

#### **4. Further Information**

[Staying Safe and Well: Health and Safety Policies and Standards](#)

[Staying Safe and Well: Legionella](#)

[Legionnaires' disease: The control of legionella bacteria in water systems L8 \(\(Fourth Edition, 2013\) Health and Safety Executive \(HSE\)\)](#)

[Legionnaires' disease: A brief guide for duty-holders \(HSE\)](#)

[Legionnaires' disease: Technical guidance Part 3: The control of legionella bacteria in other risk systems \(HSE\)](#)

[HSE Resources: Guidance Documents, Videos and Useful Links](#)

## Appendix 1: Checklist for Recommended Frequency of Inspection of Other Risk Systems

This table 'Contains public sector information published by the Health and Safety Executive and licensed under the Open Government Licence'.

System /Service	Task	Frequency
Ultrasonic humidifiers/ foggers and water misting systems	If the equipment is fitted with UV lights, check to ensure the effectiveness of the lamp (check to see if within working life) and clean filters	Six monthly or according to manufacturer's instructions
	Ensure automatic purge of residual water is functioning	As part of machinery shut down
	Clean and disinfect all wetted parts	As indicated by risk assessment
	Sampling for legionella	As indicated by risk assessment
Spray humidifiers	Clean and disinfect spray humidifiers and make-up tanks, including all wetted surfaces, descaling as necessary	Six monthly
	Confirm the operation of non-chemical water treatment (if present)	Weekly
Air washers, wet scrubbers, particle and trivial gas scrubbers	Clean and disinfect air washers, wet scrubbers, particle and trivial gas scrubbers and water storage tanks	As indicated by risk assessment
	Apply, monitor, and record the results of the water treatment	As indicated by risk assessment
Water softeners	Clean and disinfect resin and brine tank – check with the manufacturer what chemicals can be used to disinfect resin bed	As recommended by manufacturer
Emergency showers, eyebaths and face-wash fountains	Flush through and purge to drain ensuring three to five times the volume of water in the stagnant zone is drawn off	As indicated by risk assessment, but at least every six months
	Inspect water storage tanks (where fitted)	Monthly
	Clean and disinfect shower heads, nozzles, roses, 'Y' strainers, and water storage tanks (where fitted)	Quarterly, or more frequently, as indicated by the risk assessment

System /Service	Task	Frequency
Sprinkler and hose reel systems	When witnessing tests of sprinkler blow-down and hose reels ensure that there is minimum risk of exposure to aerosols	As directed
Spa pools	Detailed HSE/PHE guidance on the management of spa pools is available in <a href="#">Management of spa pools: Controlling the risks of infection</a>	
Whirlpool baths	Drain down, clean, flush and disinfect all system components, pipework and bottles	As indicated by risk assessment
Horticultural misting systems	Clean and disinfect distribution pipework, spray heads and make-up tanks including all wetted surfaces, descaling as necessary	Quarterly or as indicated by risk assessment
Dental equipment	Drain down, clean, flush and disinfect all system components, pipework and bottles	Twice daily (typically at the start and finish of each working day). Disinfectant contact time as recommended by the manufacturer
	Clean storage bottles, rinse with distilled or Reverse Osmosis (RO) water, drain, and leave inverted overnight	Daily
	Take microbiological measurements – refer to Decontamination Health Technical Memorandum 01-05: Decontamination in primary care dental practices	As indicated by risk assessment
Vehicle wash systems	Check and clean filtration systems, collection tanks and interceptor tanks and check treatment system	As indicated by risk assessment
	A biocide programme should be in place and should be monitored and controlled similar to the standards required in cooling towers	
	Clean and disinfect system and ensure sludge tanks are emptied	
	Sample for legionella	Initially to establish that control has been achieved and thereafter quarterly or as indicated by risk assessment



System /Service	Task	Frequency
Fountains and water features	Clean and disinfect ponds, spray heads and make-up tanks including all wetted surfaces, descaling as necessary	As indicated by the risk assessment, and depending on condition
Industrial process water systems	Conduct a risk assessment of each system, preferably using an assessment team comprising members knowledgeable in legionella management and control, as well as those familiar with the design and operation of the system. Devise a control scheme based on this risk assessment.	Monitoring, inspection, and testing frequencies to be determined as indicated by the risk assessment