



Safety Services Guidance



Management of Water Systems and Control of *Legionella* in School Equipment

Key word(s) : *Legionella*; Control; Management; Water; Equipment; Treatment; Legionnaire's; aerosols; recirculating; stagnant; storage; cooling; coolant; competent person

Target audience : Those in schools responsible for ensuring equipment is maintained in a safe condition, including school safety advisors and technical managers

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Introduction

1. Schools have a variety of equipment which uses and/or stores water and some may represent a *Legionella* risk. HSE have produced an Approved Code of Practice & Guidance document (L8 - Legionnaires' disease: the Control of *Legionella* bacteria in water systems) and associated technical guidance to assist in complying with the regulatory requirements. In order to meet the required standards, Schools must have suitable and sufficient controls in place to eliminate the risks associated with this potentially fatal disease, or to reduce the risk to an acceptable level.

Background information

2. Legionnaires' disease is a potentially fatal form of pneumonia caused by infection with the bacterium *Legionella pneumophila* (*Legionella*). Everyone is susceptible to infection but some people are at higher risk, including:
 - Those over 45
 - Smokers and heavy drinkers
 - People with underlying respiratory, kidney, lung or heart disease
 - Those with diabetes
 - Those with an impaired immune system
3. Therefore, any occupant or visitor to a building is potentially at a higher risk of developing the disease.
4. The infection is normally contracted by inhaling small droplets of water containing the bacteria (biological aerosols) which are suspended in the air. Certain conditions will increase the risk from *Legionella* if:
 - Water is stored and/or re-circulated
 - The water temperature is 20–45 °C, which will support growth of the bacteria
 - There is the potential for deposits or contaminants such as rust, sludge, scale, organic matter and biofilms that could support bacterial growth
 - It is possible for water droplets to be produced
5. It is important to control the risks by introducing measures that will both prevent or inhibit proliferation of the organisms in the water, and reduce exposure to water droplets as much as possible.
6. Equipment and systems that may represent a foreseeable risk include (this list is not exhaustive or definitive):

- Eye wash spray heads
- Water baths
- Chilled water baths
- Recirculating water vacuum systems
- Carbon dioxide incubators which hold a tray of water in the base to maintain humidity
- Ultrasonic baths
- Horticultural watering and misting systems
- Washing machines with water sump tanks
- Coolant used with lathes and machine tools
- Hoses and spray heads

Compliance with the Approved Code of Practice (ACoP)

7. The steps required by Schools to comply with the ACoP are summarised below:

- Carry out a suitable and sufficient assessment
- Implement a control scheme
- Review the control measures
- Appoint a competent person (known as the 'responsible person')

Carry out a suitable and sufficient assessment

8. A risk assessment should be carried out to identify and assess the risk of exposure to *Legionella* bacteria from work activities and water systems under the School's control, and identify any necessary precautionary measures needed.
9. The risk assessment should first address whether *Legionella* could be present and if there are conditions that support its growth. If the assessment concludes that the risk is negligible, then no further action needs to be taken. However, should the situation change, the assessment must be reviewed.
10. If a potential *Legionella* hazard is identified, then the risk assessment needs to consider whether the process could aerosolise or create droplets that could allow infection; in other words, a credible and relevant exposure risk be created. Note that this may not just be as a result of normal routine use of the equipment - the risk might arise occasionally, for example as a result of draining water for maintenance purposes. If there are no processes that could allow the *Legionella* to be transmitted, then the justification for this conclusion should be recorded. Again, should the situation change, the assessment will need to be reviewed and any necessary changes implemented.

11. If the assessment identifies that there is a risk from *Legionella*, then control measures need to be put in place to prevent and/or control the risk from exposure to *Legionella* bacteria

Implement a control scheme

12. Control measures could include:

- Taking steps to prevent the release of water droplets, e.g. by enclosing the process;
- Avoiding water temperatures and conditions that favour the growth of *Legionella* and other microorganisms;
- Avoiding situations where the water could stagnate anywhere in the equipment, e.g. by keeping any pipework as short as possible, ensuring good flow through the equipment, and/or draining the equipment when not in use;
- Preventing recirculation or re-use of water, for example by having a single pass of water through the system before being sent to drain. It is recognised that water may have to be recirculated due to cost/energy implications. In these situations, the number of recirculation cycles should be minimised wherever possible, and water replaced regularly. Alternatively, if the water is required for cooling, other means of cooling e.g. air cooling should be investigated.
- Treating the water to either kill *Legionella* (and other micro-organisms) or inhibit its growth (the risk to health from the treatment itself will need to be considered and balanced against the *Legionella* risk).

13. Often, the work required to comply with the ACoP will be straight-forward and simple to implement. For example, if a piece of equipment is out of use for protracted periods, a good solution would be to drain it and keep it empty of water. This reduces the need for flushing, cleaning and treatment.

14. Measures appropriate for certain types of equipment are listed in the following table taken from the ACoP.

Equipment/System	Control Task	Frequency
Emergency showers, eyebaths and face-wash fountains	Flush through and purge to drain ensuring three to five times the volume of water in any stagnant zone is drawn off	As indicated by risk assessment, but at least every six months or more frequently if recommended by manufacturer. It may be more convenient to combine the control task with other more frequent

	<p>Inspect water storage tanks (where fitted)</p> <p>Clean and disinfect shower heads, nozzles, roses, 'Y' strainers, and water storage tanks (where fitted)</p>	<p>checks.</p> <p>Monthly</p> <p>Quarterly, or more frequently, if indicated by the risk assessment</p>
Horticultural watering and 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	<p>Drain down, clean, flush and disinfect all system components, pipework and bottles</p> <p>Clean storage bottles, rinse with distilled or Reverse Osmosis (RO) water, drain, and leave inverted overnight</p> <p>Take microbiological measurements – refer to Decontamination Health Technical Memorandum 01-05: Decontamination in primary care dental practices</p>	<p>Twice daily (typically at the start and finish of each working day). Disinfectant contact time as recommended by the manufacturer</p> <p>Daily</p> <p>As indicated by risk assessment</p>
Coolant used with lathes and machine tools	Clean and disinfect storage tank and distribution system	Every six months

15. The ACoP does not address all possible systems and so the School risk assessment will need to consider the frequency of either regular flushing or cleaning with disinfection. The manufacturer's instructions should be used as a starting point.

16. Taking water samples for bacteriological testing will not normally be required. However, it may be considered necessary in specific cases where temperature cannot be maintained outside the range 20-45°C, if any case(s) of illness are suspected, or where the effectiveness of other control measures cannot be assured or needs validating (e.g. reliance on chemical treatments). Where bacterial testing is identified as being necessary, the risk assessment should consider how this should be done, and what action should be taken in light of the test result.

Review the control measures

17. The management controls for implementing and monitoring of the precautions should form a part of the normal School safety management arrangements

Appoint a competent person

18. Schools should appoint a competent person or persons to help undertake the measures needed to comply with these requirements. The appointed competent person (or persons) should have sufficient authority, competence and knowledge to ensure that the control scheme is carried out in a timely and effective manner.
19. In particular, they person should know the potential sources of *Legionella* bacteria, the risks they present, the measures needed to take to protect the people concerned, and the action to take to ensure that the control measures remain effective.
20. It might be appropriate to appoint a school safety advisor or school biological safety advisor to this role, along with a nominated deputy.

Record keeping

21. Records relating to the control scheme should be kept. These should include:
- Names and positions of appointed managers and persons responsible for each item of equipment or systems identified as a possible source of *Legionella*
 - Significant findings of the risk assessment
 - The control scheme implemented
 - Records of any inspection, maintenance, remedial measures, disinfection, cleaning, etc.
 - 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
22. These records should be retained for at least two years. Records of any monitoring inspection, test or check should be kept for at least five years.

Role of Estates

23. To comply with the HSE Approved Code of Practice & Guidance – L8 on Legionnaires Disease: the Control of *Legionella* bacteria in water systems, employers and owners of buildings must have suitable and sufficient controls in place to eliminate the risk of this potentially fatal disease, or to reduce the risk to an acceptable level.
24. The Estates Directorate has undertaken a risk assessment for each building. The building risk assessment is the driver for controls to manage *Legionella* in building water storage and distribution services. It is essential that no modifications or additions are made to the building water infrastructure in terms of additional sinks showers or other equipment without the written approval from Estates. This is to prevent inappropriately designed pipework and outlets being installed that compromises the Building Risk Assessment and water backflow arrangements.
25. Any such work should be carried out by Estates Maintenance Service or Design Services Unit who will be aware of the implications.
26. Emergency showers and showers have been identified by Estates. These will be subject to a regime of flushing and regular cleaning unless engineered to be regularly flushed. For general purpose showers, Estates will instigate the appropriate regime and maintain relevant records. For emergency showers in laboratories, schools will be asked to carry out regular flushing, and report details to Estates. Schools should keep under review the need for emergency showers, and arrange for their removal if they are no longer needed.
27. Although hot and cold water services are the responsibility of Estates, Schools should inform them of any outlets that are rarely used (e.g. showers or sluices no longer required) or when any water system is taken out of use (e.g. a laboratory is to be used as office space while retaining laboratory sinks).
28. During the summer when ambient temperatures may encourage the growth of *Legionella*, and where water outlets are likely to remain unused for more than 1 week, an increased risk exists. Of particular concern are areas containing a significant number of water outlets, such as teaching laboratories, which may not be used for several weeks over the summer break.
29. The suggested hierarchy of measures that should be used to control the risk is:
 - Permanent isolation of the water outlet(s) – this option should be considered if the service is effectively redundant, i.e. unused or unnecessary sink or wash hand basin in an office area. Notify Estates so that the water supply will be isolated and supply pipe work removed.
 - Securing of the area to prevent access – this may be feasible for teaching laboratories where access can be restricted and should be accompanied by notices prohibiting use of the water outlets. The responsibility for this rests with the School.

- Regular flushing of water outlets – where neither of the above is feasible, arrangements should be made to flush outlets to drain. The flushing should be done in such a way so as to control the production of aerosols i.e. lab taps should be fitted with a length of hose into the sink drain, other outlets should be opened slowly so as to run without excessive splashing. Normally a period of two minutes flushing per outlet will be sufficient. The responsibility for this rests with the School. A record of this activity should be kept.

30. The responsibility of Estates does not extend to any equipment or items purchased and operated by Schools. Therefore, Schools must put in place their own controls for these in order to comply with the ACoP, as discussed above.

Further Advice and Information

Sources of additional information are:

University of Manchester, Estates Directorate EPM HS4 - The Management of Water Systems and Control of *Legionella*

<http://www.estates.manchester.ac.uk/media/services/estatesandfacilities/policiesandprocedures/EPM%20HS4.pdf>

The following information is available free of charge from the HSE website: Health and Safety Executive *Legionella* and Legionnaires' disease webpages

<http://www.hse.gov.uk/legionnaires/index.htm>

Health and Safety Executive L8 Legionnaires' disease: The control of *Legionella* bacteria in water systems - Approved Code of Practice and guidance on regulations

<http://www.hse.gov.uk/pubns/priced/l8.pdf>

Health and Safety Executive HSG274 Legionnaires' disease: Technical guidance Part 3: The control of *Legionella* bacteria in other risk systems

<http://www.hse.gov.uk/pubns/priced/hsg274part3.pdf>

Document control box	
Title	Management of Water Systems and Control of <i>Legionella</i> in School Equipment
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