

Health and Safety Services

Guidance on the Management of Water Systems and Control of Legionella in School Equipment

Introduction

1. Schools have a variety of equipment which uses and/or stores water and may represent a legionella risk. To comply with the HSE Approved Code of Practice & Guidance – L8 on Legionnaires Disease : the Control of legionella bacteria in water systems, schools 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.

Background information

2. Conditions Suitable for Legionella :
 - Survival and growth of legionella bacteria is determined by water temperatures.
 - In water below 20°C, the bacteria remain dormant in low numbers.
 - In water which is between 20°C and 45°C, the bacteria multiply, so water stored within this range is a hazard.
 - In water above 45°C, bacteria growth slows.
 - At 60°C, 90 per cent of legionella will die within two minutes.
3. Legionella bacteria need nutrients to support growth, and these can be provided by:
 - sludge, scale or rust that has accumulated in reservoirs, hoses or pipework
 - foreign matter allowed into tanks through poor housekeeping or maintenance
 - pipe and connection materials that have been allowed to deteriorate
 - algae, organic matter, insects or vermin allowed to enter and remain in reservoirs or tanks
 - a bio film coating on hard surfaces or lying on the water surface.

People at Risk

4. People at risk from legionella could be any building occupant or visitor to a building.
5. Particularly vulnerable people include those over 40, especially if they are smokers, alcoholics, diabetics, have chronic respiratory or kidney disease, cancer, or if they are on renal dialysis or immunosuppressant drugs.

Equipment and Systems that may Present a Foreseeable Risk of Legionnaires' Disease:

6. Water outlets and systems which might release a spray should be identified. In laboratory and workshop areas these may include (list is not 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 5 steps required by schools to comply with the ACOP are summarised below:

- ✓ **Make key appointments**
- ✓ **Carry out a suitable and sufficient assessment**
- ✓ **Prepare a scheme for preventing or controlling the risk.**
- ✓ **Implement, manage and monitor precautions**
- ✓ **Keep records**

8. **Make key appointments :**

- A nominated person (such as an school safety advisor, or school biological safety advisor)
- A nominated deputy
- These persons are responsible for the management and control of legionella in school equipment and systems that use or store water.
- A person responsible for the maintenance of each item of school equipment or system that uses or stores water

9. **Carry out a suitable and sufficient assessment** to identify and assess the risk of exposure to legionella bacteria from work activities and water systems under the School's control, and implement any necessary precautionary measures based on the risk assessment.

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11. The risk assessment should first address whether Legionella could be present and if there are conditions that support the growth of Legionella. If the answer is negative, then no further action needs to be taken. However, should the situation change, the assessment will need to be reviewed.
12. If there is a hazard from Legionella and the process conditions support the growth of Legionella, then the risk assessment needs to consider whether the process could aerosolise or create droplets that could allow infection; in other words could a risk be created. Note that part of the process may include draining water for maintenance purposes and consequently the risk of generating aerosols will need to be considered. If there are no processes that could allow the transmission of Legionella then the reason for the absence of a risk should be recorded in the assessment. Again, should the situation change, the assessment will need to be reviewed and any necessary changes implemented.
13. 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
14. The control measures could include:
 - Taking steps to prevent the release of water spray eg by enclosing the process;
 - Avoiding water temperatures and conditions that favour the growth of legionella and other microorganisms;
 - Making sure that water cannot stagnate anywhere in the equipment by keeping any pipework as short as possible, ensuring good flow through the equipment, and draining the equipment when not in use;
 - Checking how water is used in the system – it is better to have a single pass system ie water is circulated once through a piece of equipment eg to cool it, and then disposed down the drain than continuous recirculation of water. However, because of cost/energy implications, water may have to be recirculated, but the number of passes should be minimised if possible, and water replaced regularly eg each day. Alternatively, if the water is required for cooling, other means should be investigated eg air cooling; and
 - Keeping the equipment and the water in it clean – this could include treating the water to either kill legionella (and other micro-organisms) or limit their ability to grow.
15. **Prepare a scheme for preventing or controlling the risk.** Often, the work required to comply with the ACOP will be straight-forward and simple to implement. For example, if a piece of equipment has periods of extended non-use, the best advice is to drain down and keep it empty of water. This reduces the need for flushing, cleaning, disinfection etc.
16. Measures appropriate for certain types of equipment are listed in the following table taken from the ACOP.

Equipment/System	Control Task	Frequency
Eye wash spray heads	Flush through and drain	Once every six months or more frequently if recommended by manufacturer. It may be more convenient to combine the control task with other more frequent checks.
Horticultural watering and misting systems	Clean and disinfect distribution pipework, spray heads and make – up tanks, including all wetted surfaces, de-scale as necessary	Annually
Coolant used with lathes and machine tools	Clean and disinfect storage tank and distribution system	Every six months

17. The ACOP does not address all possible risk systems and therefore 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.

18. Taking water samples for bacteriological testing will not normally be required (see ACOP, paras 185-189). However, it may be considered necessary in specific cases where temperature cannot be maintained outside the range 20-45°C, if any outbreak or case of illness is suspected, or where other control measures have to be validated. In the latter example, the risk assessment should address how bacteriological testing is being used.

19. **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.

20. **Keep records of the following:**

- Names and positions of appointed managers and 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, 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

Role of Estates

21. 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.

22. 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 of the design by D A Brown who is the Responsible Person for legionella control. This is to prevent inappropriately designed pipework and outlets being installed that compromises the Building Risk Assessment and water backflow arrangements.
23. Application should be made to david.a.brown@manchester.ac.uk.
24. Work should be carried out by Estates Maintenance Service or Design Services Unit who will be aware of the implications.
25. Estates' responsibility does not extend to equipment or items purchased and operated by schools, which stores or uses water. Therefore, schools must put in place their own controls to comply with the Approved Code of Practice (ACOP).

Emergency Showers, Showers and Taps

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 remove them if they are no longer needed.
27. Although hot and cold water services are the responsibility of Estates, Schools should inform them of any little used outlets, eg showers or sluices no longer required, or when any water system is taken out of use eg a laboratory is to be used as office space while retaining laboratory sinks. Estates (David Brown or Lynton Prescott) should be advised of any underused out-lets.
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, then an increased risk must be considered to exist. 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 and where outlets can be safely flushed prior to use – see below. 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. It is recommended that a record of this activity is kept.


Further Advice and Information

Sources of additional information are:

University of Manchester, Estates Directorate document on The Management Water Systems and Control of Legionella, University of Manchester Estates is available at : <http://www.estates.manchester.ac.uk/DirectorateOfEstates/Procedure%20and%20Information/Documents/New%20legionella/Policy%20Document%202007.pdf>),

The following documents are available free from the HSE's website at <http://www.hse.gov.uk/legionnaires/info.htm>

Legionnaire's disease - Essential information for providers of residential accommodation [PDF 56kb]  <http://www.hse.gov.uk/pubns/indg376.pdf>

Legionnaires Disease - A guide for Employers [PDF 2.8mb]  <http://www.hse.gov.uk/pubns/iacl27.pdf>

Legionnaires' Disease: Controlling the risks associated with using spa baths [PDF 24kb]  <http://www.hse.gov.uk/pubns/spalegion.pdf>

HSE Research Report RR140 Evaluation of HSC's ACOP and guidance 'Legionnaires disease: control of legionella bacteria in water systems' (L8) <http://www.hse.gov.uk/research/rrhtm/rr140.htm>

The L8 ACOP itself is a priced publication, but is available online from the JRUL electronic databases, Occupational Health & Safety Information Systems (OHSIS).

A brief guide to the Regulations: What you need to know about the Control of Substances Hazardous to Health Regulations 2002 (COSHH) <http://www.hse.gov.uk/pubns/indg136.pdf>

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