Ards and North Down Borough Council

Environmental Health Protection and Development

Guidance for Providers of Residential Accommodation on the Control of Legionella

Legionnaires' Disease – what is it?

Legionnaires' disease is a potentially fatal pneumonia caused by Legionella bacteria. It is the most well known and serious form of a group of diseases known as Legionellosis.

Legionella bacteria are widespread in the environment, and may contaminate and grow in water systems such as **hot and cold water systems, spa pools and cooling towers**.

Infection is caused by breathing in small droplets of water contaminated by the bacteria. The disease cannot be passed from one person to another.

Everyone is potentially susceptible to infection but some people are at higher risk for example, those over 45 years of age, smokers, those suffering from respiratory or disease, and people whose immune system is impaired.

Exposure to legionella bacteria is reasonably foreseeable anywhere water is used or stored and there is means of creating an aerosol (for example at taps, showerheads etc)

RISK ASSESSMENT

A risk assessment is an important step in protecting your workers and your business as well as complying with the law. It helps you focus on the risks that really matter in your workplace; the ones with the potential to cause real harm.

In premises where there is a risk of legionella growing within a water system, there is a requirement under health and safety law for duty holders to carry out a suitable and sufficient risk assessment to identify and assess the risk of exposure to legionella bacteria.

A competent person who has the relevant knowledge and expertise must carry out the risk assessment. You may require expert help from a consultant such as a water treatment company, water hygiene specialist or a building services engineer.

This guidance has been provided to assist you in this regard, however it is not intended to be used as a substitute to the **Approved Code of Practice entitled "*Legionnaires' Disease - The Control of Legionella Bacteria in Water Systems" L8 2000 2nd edition*** (ISBN 0 7176 1772 6) available from HSE Books PO Box 1999, Sudbury, Suffolk, CO10 6FS Tel 01787 881165.

Risk assessment – getting started

The factors outlined below must be addressed in the risk assessment: -

Step 1: Assess Sources of Risk in Your Hot and Cold Water System

Are conditions present, which will encourage bacteria to multiply? Record your answers to the following questions…

a) Is the source of the water supply other than a mains supply eg spring/ borehole?

b) Are there means by which an aerosol can be created e.g. taps, showers, spa baths etc?

c) Is the water temperature between 20°C and 45°C (consider warm weather, presence of thermostatic mixing valves which set hot water between 20°C and 45°C, uninsulated cold water storage tanks, etc)? Water temperatures should be taken and recorded to establish actual temperatures.

20°C ← Danger Zone → **45°C**

d) Are there any sources of possible contamination (uncovered and/or rusty water storage tanks, etc)?

e) Are there areas where water could stagnate? (taps or showers used less than once a week; changes resulting in redundant pipe work; multiple cold water storage tanks; pipes to washing machine no longer used etc)

f) Is there debris (rust, sludge) in the pipe work?

g) Are there any employees, residents, visitors etc vulnerable to infection (elderly or ill)?

Answering yes or don't know to any of the questions above suggests that there may be an increased risk to persons being exposed to legionella and falling ill. A written scheme for controlling the risk must then be implemented.

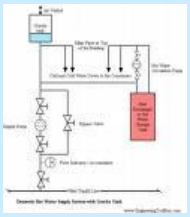
Step 2. Evaluation of Risk

If your assessment in step 1 indicates a risk of exposure to legionella which cannot be prevented then a written scheme (plan) should be implemented and properly managed. To do this effectively

YOU MUST HAVE:-

- **An up-to-date drawing/diagram (schematic) showing the layout of the hot and cold water system including parts that are temporarily out of use.**

This should identify piping routes, storage and header tanks, calorifiers and relevant items of plant especially water softeners, filters strainers, pumps and all water outlets. You should then decide which parts of the water system might pose a risk to help identify appropriate precautions in section 5 below.



- **A description of the operation of your hot and cold water system.**

You need to describe the type, location and volume of cold water storage tanks; flow of cold water through the premises; whether the taps, showers, toilets are fed from the cold water tanks or rising mains; how hot water is heated, stored and distributed through the building (gravity fed/pressurised etc) These plans should be reviewed annually to ensure they are up to date.

- **A description of the precautions/controls that are presently being taken at your premises along with an evaluation of these controls.**

Examples of typical controls are included in step 3 although a more comprehensive list is contained within the Approved Code of Practice on Legionnaires' disease. Nb You should only record measures that are currently in place. If there are none then say so! If you intend to introduce additional control measures these should be included in the next section.

- **A list of additional control measures you intend to take to control Legionella bacteria at your premises**. (See step 3 and 4) Include in this section additional control measures you intend to introduce and by when.

- **A description of the checks to be carried out to ensure the efficiency of the scheme and frequency of such checks**, and finally

- **A plan of action should checks reveal that the controls are not effective.**

Step 3. Evaluation of existing control measures

You should use the following list to help identify whether you have already implemented controls/precautions to minimise risk of legionella growth and to assess whether they are adequate.

Consider precautions such as:-

a. Controlling the release of water spray where possible

b. Avoiding water temperature and conditions that favour the growth of legionella bacteria and other micro-organisms (ie 20°C- 45°C)

c. insulating cold water storage tanks and hot and cold water pipes;

d. fitting cold water storage tanks with a tight fitting lid with insect screens fitted to pipe work open to the atmosphere;

e. ensuring that the correct size of calorifier is used to meet daily fluctuations in hot water use while maintaining a supply temperature of at least 50°C; fit shunt pumps to larger calorifiers to overcome temperature stratification of stored water;

f. Where TMV's (Thermostatic Mixing Valves) are used ensure these are fitted as CLOSE as possible to the point of use;

g. Ensuring that the vent pipe from the hot water tank (calorifier) does not discharge into the cold water storage tank(s);

h. Avoid water stagnation (eg in blind or dead ends and especially where multiple cold water tanks or calorifiers are connected;)

i. Remove redundant pipework and infrequently used outlets;

j. Minimise the volume of cold water storage (one day's water use is enough)

k. Flush through little used outlets weekly;

l. Avoiding materials that would harbour bacteria and other microorganisms or provide nutrients for microbial growth (e.g. old rusty galvanised tanks, natural rubber, hemp, fibre washers). Use copper, plastic and stainless steel where possible;

m. Where water temperature is used to control legionella growth the hot water should be stored at 60°C and reach outlets at 50°C.

n. Maintaining the cleanliness of the water system and the water in it by regular cleaning and/or disinfection;

Step 4 Use of additional control measures

What should I do next?

In general the precautions mentioned in step 3 above are all necessary to minimise risk of legionella growth so if these control measures are not already in place, then action should be taken to implement them.

- **Temperature Control**

The primary means of control for hot and cold water systems is **temperature**, however where it is not possible to maintain correct temperatures then chemical controls may also be needed.

TEMPERATURE REGIME

Hot water Storage 60°C
Hot Water Distribution 60°C
Hot Water at tap 50°C (within 1 minute at outlet)
Cold Water Storage < 20°C
Cold Water distribution < 20°C
Cold Water at tap < 20°C (within 2 mins)

NB at 50°C there is a risk of scalding particularly to young children, elderly or disabled and this may mean that other precautions are needed.

The temperature regime will only be effective if the system is kept clean.

- **Chemical Control**

These include the use of biocides, chlorine dioxide, ionisation, ozone and UV treatments. These control methods all require competent help to implement and manage and may be needed where satisfactory temperature control cannot be achieved.

Step 5. Review of Control measures

Where temperature control is relied upon as the primary means of control, monitoring of the temperature control regime is essential. The checks in **Table 1** (see page 7) should be undertaken and remedial action taken if necessary. Records must be kept of these checks.

In addition, general monitoring as per **Table 2** (page 8) should be also undertaken.

Table 1 Monitoring The Temperature Control Regime

Frequency	Check	Standard to Meet for Cold Water	Standard to meet for Hot Water	Notes
Monthly	Sentinel* taps (see below)	The water temperature should be below 20ºC after running the water for up to 2 minutes	The water temperature should be at least 50ºC within a minute of running the water	This check makes sure that the supply and return temperatures on each loop are unchanged, i.e. the loop is functioning as required
Monthly	If fitted, input to TMV's on a sentinel* basis		The water supply to the TMV temperature should be at least 50ºC within a minute of running the water	One way of measuring this is to use a surface temperature probe
Monthly	Water leaving and returning to calorifer		Outgoing water should be at least 60ºC, return at least 50ºC	If fitted, the thermometer pocket at the top of the calorifier and on the return leg are useful points for accurate temperature measurement. If installed, these measurements could be carried out and logged by a building management system.
Six Monthly	Incoming cold water inlet (at least once in the winter and once in the summer)	The cold water should preferably be below 20ºC at all times		The most convenient place to measure is usually at the ball valve outlet to the cold water storage tank
Annually	Representative number of taps on a rotational basis	The cold water temperature should be below 20ºC after running the water for 2 minutes	The hot water temperature should be at least 50ºC within a minute of running the water	This check makes sure that the **whole system** is reaching satisfactory temperatures for legionella control

* Sentinel taps – For a hot water services the first and last taps on a recirculating system. For cold water systems (or non-recirculating hot water systems) the nearest and furthest taps from the storage tank. The choice of sentinel taps may also include other taps which are considered to represent a particular risk.

Table 2 Recommended Inspection Frequencies

Service	Task	Frequency
Hot Water Services	Arrange for samples to be taken from hot water calorifiers, in order to note condition of drain water (and assess whether debris is present)	**Annually**
	Check temperatures in flow and return at calorifiers (see Table 1above)	**Monthly**
	Check hot water temperature up to one minute to see if it has reached 50ºC in the sentinel taps	**Annually**
Cold Water Services	Check tank water temperature remote from ball valve and mains temperature at ball valve. Note maximum temperatures recorded by fixed max/min thermometers where fitted.	**Six monthly**
	Check that temperature is below 20ºC after running the water for up to 2 minutes in the sentinel taps	**Monthly**
	Visually inspect cold water storage tanks. Check that water surface is clean & shiny and that the water is free from debris traces of vermin or contamination. Check if water is circulating adequately with no evidence of stagnation Check lid is tight fitting and in good condition and robust insect screens are present. Check thermal insulation is in good condition Check representative taps for temperature as above on a rotational basis.	**Annually**
Shower heads	Dismantle, clean and descale shower heads and hoses (see below)	**Quarterly or as necessary**
Little-used outlets eg showers and taps	Flush through little used outlets and purge to drain, or purge to drain immediately before use, without release of aerosols Alternate duty/standby pumps	**Weekly**
Other checks	Ensure plan of hot and cold water circuits up to date Ensure records of temp checks up to date and available	**Annually**

Shower Head Disinfection (using sodium hypochlorite)

- Disconnect shower heads
- Dismantle and brush clean, washing with water
- Place dismantled shower heads in a container of 5% sodium hypochlorite and soak for 30 minutes
- Remove and wash thoroughly in running water
- Reassemble and return to service

SYSTEM CLEANING AND DISINFECTION

Finally, is this necessary for your system?

- Does routine show inspection this to be necessary (see tables 1 & 2)?
- Has the system or part of it been altered or entered for maintenance purposes in a manner which may have led to contamination?
- Has there been an outbreak or suspected outbreak of legionellosis?

If you have answered yes, then cleaning and disinfection will be necessary.

Disinfection can be:-

- Chemical
  Usually chlorination – seek professional advice or help

Or

- Thermal
  This involves raising the hot water temperature so that it is at least 60°C at all taps and appliances. Water should circulate at this temperature for at least **1hour** and each tap and appliance should run sequentially for at least 5 minutes and the temperature taken and recorded

***Nb** due to the risk of scalding, precautions should be taken*

Step 6. Record Keeping

Records should be kept for at least 5 years. These should include details of:-

- The person or persons responsible for conducting the risk assessment, and managing and implementing the written scheme,
- The written scheme and the results of the monitoring, inspection, tests or checks along with relevant dates
- Plans or schematic drawings
- Details of precautionary (control) measures
- Remedial works and details of visits by consultants, contractors and other relevant personnel.

The risk assessment must be dated and signed by person(s) responsible for carrying out the risk assessment, managing and implementing the control measures. It should be regularly reviewed and whenever there is reason to suspect that it is no longer valid.