Relevant Legislation

Control of Substances Hazardous to Health Regulations 2002
Legionnaire's Disease: The control of legionella bacteria in water systems Approved Code of Practice and guidance (L8)
Notification of Cooling Towers and Evaporative Condensers Regulations 1992

General

Legionella bacteria are common in natural water courses, such as rivers and ponds. Since legionella are widespread in the environment, they may contaminate and grow in other water systems such as hot and cold water services. Certain conditions increase the risk from the bacteria if:

(a) the water temperature in all or some parts of the system is between 20–45 °C which is suitable for growth (they are killed by high temperatures).

(b) it is possible for water droplets (aerosols) to be produced and if so, they can be dispersed;

(c) water is stored and/or re-circulated;

(d) there are deposits that can support bacterial growth, such as rust, sludge, scale, organic matter and biofilms.

Legionnaires' disease is a potentially fatal form of pneumonia normally contracted by inhaling water droplets (aerosols), suspended in the air, which contain the legionella bacteria. This is the most well-known and serious form of a group of diseases known as legionellosis. Other similar (but usually less serious) conditions include Pontiac fever and Lochgoilhead fever. 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 and heavy drinkers, those who have chronic respiratory or kidney disease and people whose immune system is impaired.

Legal Duties

It is a legal requirement to consider the risks from legionella that may affect employees or members of the public and take suitable precautions. It is the responsibility of the employer or a person in control of the premises (dutyholder) to:

- Identify and assess sources of risk.

- Prepare a scheme (or course of action) for preventing or controlling the risk.
- Implement and manage the scheme - appointing a person to be managerially responsible, sometimes referred to as the 'responsible person'.
- Keep records and check that what has been done is effective.

Risk Assessment

The risk assessment is the responsibility of the employer or person in control of the premises. Where necessary, this is to be carried out by calling upon the assistance of skilled employees from within an organisation or if this is not available, from outside sources, such as consultancies. It is necessary to find out if the water systems (including the equipment associated with the system such as pumps, heat exchangers, showers etc) are likely to create a risk. Managers should ask the following:

- Are conditions present which will encourage bacteria to multiply? For example - is the water temperature between 20-45°C?
- Is it possible that water droplets will be produced and, if so, could they be dispersed over a wide area? For example, consider showers; and
- Is it likely that anyone particularly susceptible will come into contact with the contaminated water droplets?

High Risk Systems

Cooling towers, evaporative condensers and hot and cold water systems have been associated with outbreaks. Other potential sources where precautions might be needed include showers, humidifiers and spa baths. If, the risks are deemed insignificant, the assessment is complete and no further action needs to be undertaken other than to review the assessment periodically in case anything changes in the water system.

Preventing or Controlling the Risk

If a risk is identified which cannot be prevented, a regime of precautionary measures should be established to control and where possible prevent the legionella bacteria from proliferating into sufficient numbers to cause harm. The following measures are all essential

- careful planning.
- implementation of a successful management policy.
- employment of competent staff.
- attention to proper control strategies.

Ideally, the employer should consider whether the risk of legionella can be prevented in the first place by looking at the type of water system that is needed. However, it is essential that a written scheme which sets out how the employer intends to control the risk from legionella is prepared. This should describe:

- the system - an up-to-date plan or schematic diagrams must be sufficient.
- who is responsible for carrying out the assessment and managing its implementation.
- the safe and correct operation of the system.
- what control methods and other precautions are to be used.
- the checks that will be carried out on the control scheme and how often these checks will be carried out.

The key point is to design, maintain and operate the water services under conditions which prevent or control the growth and multiplication of legionella.

In addition it is necessary to:

- ensure that the release of water spray is properly controlled.
- avoid water temperatures and conditions that favour the growth of legionella and other microorganisms.
- ensure water cannot stagnate anywhere in the system by keeping pipe lengths as short as possible or by removing redundant pipework.

- avoid materials that encourage the growth of legionella.

- keep the system and the water in it clean; and, treat water to either kill legionella (and other micro-organisms) or limit their ability to grow.

Keeping the water in a cooling tower system clean will not only control legionella, it will also lead to other advantages. Reducing scale and fouling also ensures that the cooling process is operating efficiently – scaling reduces the effectiveness of biocide treatment and fouling can lead to loss of plant performance.

Methods of Water Treatment

One way of controlling legionella is to keep water hot, which the employer may be doing for other reasons already. For example, nursing homes and residential care homes tend to keep water hot for reasons other than controlling legionella, including kitchen and laundry use, to ensure proper boiler operation, or to take account of long pipe runs.

However, care is needed where water runs hot. The risks of scalding should be assessed and appropriate measures taken to prevent burns, such as warning notices and thermostatic mixing valves on taps.

Cooling towers/systems are often treated using biocides. However, there are other treatment strategies available such as ultra violet (UV) irradiation, copper/silver ionisation and using ozone.

In hot and cold water systems legionella has traditionally been controlled by storing hot water above 60°C and distributing it at above 50°C - and keeping cold water below 20°C if possible. Other methods which are used include copper/silver ionisation and chlorine dioxide.

Taking Samples to Test for Legionella

Sampling and testing for the presence of legionella bacteria is just one way of checking that the system is under control. However, it is not a simple test - sampling and detecting legionella requires specialist help. Part 2 of the ACOP and guidance gives further advice.

Managing the Risk

It is necessary to appoint someone to take responsibility for managing the control scheme that has been put in place. The 'responsible person' needs to be competent - that is, they need to have sufficient knowledge and experience of your system to enable them to manage and control the scheme effectively. If there are several people responsible for managing the system and/or control scheme it will be necessary to make sure that everyone knows what they are responsible for and how they fit into the overall management of the system. Appropriate 'training should be undertaken by the person in charge of the premises and the 'responsible person'. An e-learning module on Legionella Awareness is available via the Council's Learning Together e-learning package.

If contractors are used to carry out water treatment or other work, it is still the responsibility of the appointed person to ensure that the treatment is carried out to the required standards. Before utilising the services of a contractor, the employer must be satisfied that they can do the work to the standard that required. The HSE has produced a Code of Conduct for service providers.

Record Keeping

A 'legionella log' should be kept at each site and should contain all documentation relating to water hygiene. The current NCC water hygiene contractor maintains a web based electronic system where Managers log on to view the report for their establishment. It is vital that the content of reports are shared with appropriate members of staff and any required actions implemented. Records must be kept for a minimum of five years.

Duties on Other Parties

Anyone who is involved in the supply of water systems and their components (such as designers, manufacturers, water treatment companies and suppliers) has to make sure that such equipment is designed and made in such a way that it is safe to use and that it can be easily cleaned and maintained.

They should inform the employer of the risks that might be present and how the system can be operated and maintained safely. If the employer is using products or services (for example, for water treatment) the suppliers must make sure that these are effective at controlling legionella and that they can be used safely. They should also tell the employer if, while they are treating the system, they find any problems which could pose a significant risk of legionella exposure.

Other Duties

If the employer has a cooling tower or evaporative condenser on site it is necessary to notify the local authority (via their Environmental Health Practitioners) in writing with details of where it is located. It is also necessary to tell them when or if such devices are no longer in use. If a manager has a case of legionellosis in an employee who has worked on cooling towers or hot water systems that are likely to be contaminated with legionella, this must be reported to the HSE under RIDDOR.

Arrangements within Each Directorate

Water Hygiene Programme – Control of Legionella

When establishments subscribe to the Statutory Inspection and Testing SLA with Property Services they will receive the following services via a reputable contractor.

The Water Hygiene Programme shall be carried out in accordance with the Health and Safety Executive's (HSE) Approved Code of Practice and Guidance L8 'The control of Legionella bacteria in water systems'.

A full schedule detailing tasks and frequencies of the Water Hygiene and Legionella Control Scheme is given below. These tasks are carried out in each of the County Council's portfolio of buildings containing domestic water services systems

New systems should be designed to minimise the risk for Legionella. The Building Manager should inform the Property Services Help Desk of any systems that are not being tested so that they can be added to the testing and maintenance regime.

Under local management of schools (LMS) arrangements, the Headteacher may choose not to subscribe to the above SLA with Property Services. As the person in control of the premises, the Headteacher must ensure that competent advice is sought from a suitably experienced and reputable source (see also sections E3 and J2 of the Schools H&S Manual).

In all cases it is vital that required actions contained within water hygiene reports are acted upon.

Water Hygiene and Legionella Control Scheme

The tasks identified below are to be undertaken by those who manage the site and the Water Hygiene Contractor respectively at the intervals specified.

Site

Task	Frequency
Flush little used outlets, (flush to clear leg of pipe work back to ring main or tank/calorifier. Record the findings in the flushing log.	Weekly
Check water consumption of cold-water tanks over a typical day.	Annually
Carry out actions or remedial works on water systems in accordance with the recommendations of the report/risk assessment of the water hygiene contractor, when it is deemed necessary to reduce the risk of exposure.	As and when required

Water Hygiene Contractor

Task	Frequency
Carry out a full risk assessment of all water systems. Identify and assess potential sources of risk and report on remediation, monitoring requirements and current risk levels.	At least every two years
Monitor temperature levels of all sentinel outlets on domestic systems. Cold to be below 20^{o}C within 2 minutes. Hot to be above 50^{o}C within 1 minute.	Monthly
Monitor temperature levels of all calorifiers at the flow and return (>60^{o}C)	Monthly

Monitor temperature levels of all domestic showerheads (to be between 41^{o}C and 45^{o}C)	Quarterly
Dismantle, clean, de-scale and disinfect showerheads and spray taps.	Quarterly
Inspect all calorifiers externally, appraise the design, monitor storage temperature and purge calorifier drain valve until the water runs clear.	Quarterly
Take cold water storage tank and ball valve temperature (Summer and Winter)	Six-monthly
Inspect all domestic cold-water storage tanks, appraise the design, visually inspect the internal and external cleanliness and report on any required remedial works.	Six-monthly
Monitor temperature of all hot and cold tap outlets (10% per month on a rotational basis). Cold to be below 20^{o}C within 2 minutes. Hot to be above 50^{o}C within 1 minute.	Annually
Carry out a formal review of the effectiveness of the hygiene maintenance programme.	Annually
Clean and disinfect entire domestic water system from source to outlet in accordance with current guidelines	As and when required
Take a water sample from every cold-water storage tank, calorifier, random tap outlet and shower prior to the cleaning of the systems. Test samples via a UCAS accredited laboratory for the Legionella pneumophila bacteria and report on results. If a pre-sample returns a positive result take further water samples from the same sources and have them tested by a UCAS accredited laboratory.	As and when required