



Water Monitoring Ltd.

Premises Advice

Legionella Awareness

Introduction Background to the Disease

Legionella

Legionnaires' disease is a potentially fatal form of pneumonia. Although it can affect anyone, certain groups are more susceptible, including the very young, people over 45, people already suffering from an illness (especially cancer or diabetes), people with a weakened immune system, and smokers. Men also appear to be more susceptible than women. The disease is caused by the Legionella Pneumophila bacterium and related bacteria. Legionella bacteria can also cause other less serious illnesses such as Pontiac Fever and Lochgoilhead Fever. Legionellosis is the collective term used to describe the group of diseases caused by Legionella bacteria. Legionellosis is contracted by inhaling the bacteria in aerosols (water droplets). There is an incubation period of 2-10 days before symptoms ranging from a mild influenza-like infection to full-blown pneumonia. In the cases of Pontiac Fever and Lochgoilhead Fever, the symptoms are a short fever without signs of pneumonia. In approximately 12% of reported cases, infection with Legionella bacteria is fatal. The level of fatalities is significantly higher among risk groups.

Proliferation of Legionella

Legionella bacteria occur naturally (in low numbers) in most natural sources of water and can survive at temperatures ranging from 6°C to 60°C. They can remain dormant at low temperatures and multiply readily at temperatures between 20°C and 45°C, providing they have a suitable supply of nutrients. Legionella bacteria are at their most virulent at 37°C.

The bacteria will survive at higher temperatures, but the survival rate decreases from a matter of hours at 50°C, to one minute at 60°C, whilst at 70°C the organism is killed instantaneously. Below 37°C the multiplication rate decreases and can be considered to be insignificant below 20°C.

Bacterial growth will be encouraged by water systems suffering from stagnation, or which contain certain materials that may serve as a source of nutrition to the bacteria. Contaminated water only presents a risk when dispersed into the air as an aerosol, which may then be inhaled.

The fine particles can remain airborne for long periods and small droplets have the potential to penetrate deep into the lungs and cannot be easily expelled. Larger droplets evaporate and become smaller but still contain the initial number of organisms.

Legionella bacteria can obtain the nutrients that they need to multiply from a wide variety of sources, including algae, amoebae, sediment, sludge, scale, corrosion by-products, biofilms and other bacteria.

Summary of facts:

Below 6°C	Bacteria cannot survive
6°C – 20°C	Dormant
20°C – 45°C	Temperature range encourages growth/multiplication/spread
45°C – 60°C	Dormant
Above 60°C	Above this temperature legionella bacteria will not normally survive (this is the main Method of control).

Identifying Risks

Systems Most At Risk

Anywhere where water is stored or used between the temperatures of 20°C and 45°C in the presence of nutrients, is a potential breeding ground for Legionella bacteria. Where infected water is formed into a spray or mist, the risk of inhalation and infection is significant. Areas of particular concern are:

- Water systems involving a cooling tower or evaporative condenser
- Air-conditioning systems, especially those incorporating spray humidifiers or air-washers
- Domestic hot and cold water systems in office buildings, commercial buildings, factories, leisure centres, hotels and residential accommodation amongst others
- Showers, spray heads – aerosol generating outlets
- Spa baths, Jacuzzis and other pools in which water is agitated and re-circulated
- Other systems where water is stored between the temperatures of 20-45°C and which produce an aerosol or spray (ACOP L8 (2013), Para 19)

The most likely route for infection is by the direct inhalation of bacteria carried by water droplets in aerosol form.

Recommending Effective Solutions

Control Measures

The risk from exposure will normally be controlled by measures which do not allow the proliferation of legionella bacteria in the system and reduce exposure to water droplets and aerosol. Precautions should, where appropriate, include the following:

- Controlling the release of water spray.
- Avoidance of water storage temperatures (i.e. 20 to 45°C) and conditions that favour the proliferation of legionella bacteria and other micro-organisms.
- Avoidance of water stagnation.
- Avoidance of the use of materials that harbour bacteria and other micro-organisms, or provide nutrients for microbial growth.
- Keeping the system clean to avoid build up of sediment and bacteria.
- Use of a water hygiene programme.
- Ensuring the correct and safe operation and maintenance of the water system.

Advice on Legionnaires Disease

The Approved Code of Practice – Legionnaires Disease – the control of legionella bacteria in water systems (L8) was reviewed and the fourth edition published in December 2013.

The document is aimed at duty holders, including employers, those in control of premises and those with health and safety responsibilities for others, to help them comply with their legal duties in relation to legionella. These include identifying and assessing sources of risk, preparing a scheme to prevent or control risk, implementing, managing and monitoring precautions, keeping records of precautions and appointing a manager to be responsible for others.

This fourth edition of the ACOP and guidance on regulations contains revisions to simplify and clarify the text. The main changes are removing Part 2 & Part 3, the technical guidance, which is published separately as HSG274 and giving the following issues ACOP status:

- risk assessment;
- the specific role of the appointed competent person, known as the 'responsible person';
- the control scheme and what it should include;
- review of control measures;
- duties and responsibilities of those involved in the supply of water
- systems including suppliers of services, designers, manufacturers, importers, suppliers and installers of water systems.

Requirement to have a risk assessment

Carrying out a Legionella Risk Assessment and ensuring it remains up to date is required under the health and safety legislation and is a key duty when managing the risk of exposure to legionella bacteria. The requirement to have a risk assessment covers the person in control of the premises or responsible for the water systems in their premises. They have a legal duty to ensure that the risk of exposure to legionella bacteria is properly assessed and controlled. This duty extends to residents, guests, tenants and customers. It also covers those who have, to any extent, control of premises for work-related activities or the water systems in the building and responsibility to those who are not their employees, but who use those premises.

Where a property has a number of occupiers the management contract should clearly specify who has responsibility for maintenance and safety checks, including managing the risk from legionella. Where there is no contract or agreement in place or it does not specify who has responsibility, the duty is placed on whoever has control of the premises and the water system in it, and in most cases, this will be the landlord themselves.

In estate management, it is increasingly common for there to be several duty holders in one building. In such cases, duties may arise where persons or organisations have clear responsibility through an explicit agreement, such as a contract or tenancy agreement.

The extent of the duty will depend on the nature of that agreement. For example, in a building occupied by one leaseholder, the agreement may be for the owner or leaseholder to take on the full duty for the whole building or to share the duty. In a multi-occupancy building, the agreement may be that the owner takes on the full duty for the whole building. Alternatively, it might be that the duty is shared where, e.g. the owner takes responsibility for the common parts while the leaseholders take responsibility for the parts they occupy. In other cases, there may be an agreement to pass the responsibilities to a managing agent. Where a managing agent is used, the management contract should clearly specify who has responsibility for maintenance and safety checks, including managing the risk from legionella. Where there is no contract or

tenancy agreement in place or it does not specify who has responsibility, the duty is placed on whoever has control of the premises, or part of the premises.

All systems require a Risk Assessment, however not all systems will require elaborate control measures. A simple Risk Assessment may show that the risks are low and being properly managed to comply with the law (e.g. small domestic-type water systems). In such cases, further action may not be needed but it is important to review regularly in case of any changes and specifically if there is reason to suspect it is no longer valid. (para 25)

The ACOP states that a suitable and sufficient assessment must be carried out to identify and assess the risk of exposure to legionella bacteria from work activities and water systems on the premises and any precautionary measures needed. The duty holder is responsible for ensuring the Risk Assessment is carried out. The duty holder is either:

- the employer, where the risk from their undertaking is to their employees or others; or
- a self-employed person, where there is a risk from their undertaking to themselves or others; or
- the person who is in control of premises or systems in connection with work, where there is a risk from systems in the building, e.g. where a building is let to tenants, but the landlord keeps responsibility for its maintenance. (Para 28)

The duty holder must ensure that the person who carries out the risk assessment and provides advice on prevention and control of exposure is competent to do so. (Para 29).

The Risk Assessment must be regularly reviewed and specifically when there is reason to believe that the original assessment is no longer valid. The management and communication procedures should also be updated as appropriate. (Para 32)

The ACOP also states that before any formal health and safety management system for the water systems is implemented, the duty holder should carry out a Risk Assessment to identify the possible risks. (Para 33) The assessment also enables the duty holder to show they have considered all the relevant factors and the steps needed to prevent or control the risk. (Para 34)

The ACOP states that the Risk Assessment should be reviewed “regularly”. However, if anything significant changes then the assessment should be reviewed sooner – this includes changes to the water systems and the persons in control.

The need to complete a reassessment may result from:

- changes to the water system or its use;
- changes to the use of the building in which the water system is installed;
- or to the groups of people exposed to any potential risk
- the availability of new information about risks or control measures
- the results of checks indicating that control measures are no longer effective
- changes to key personnel
- a case of Legionnaires’ disease/Legionellosis associated with the system
- the introduction of new or amended legislation or codes of practice.

Note 2 from BS8580-1:2019 on reviews: *Water systems with higher inherent risk or complex water services where changes are poorly documented may need to be reassessed frequently, e.g. annually, whereas for water systems with a lower inherent risk or those where changes are recorded and where water systems are well managed, it may be sufficient for a formal reassessment to be performed every 2-5 years.*

Management & Record Keeping

Statutory Duty Holder

The statutory duty holder is responsible for ensuring the Risk Assessment is carried out. The duty holder is either: (ACOP L8 (Fourth Edition 2013), Para 28)

- Business owner, Managing Director;
- the employer, where the risk from their undertaking is to their employees or others;
- a self-employed person, where there is a risk from their undertaking to themselves or others;
- the person who is in control of premises or systems in connection with work. where there is a risk from systems in the building, e.g. where a building is let to tenants, but the landlord keeps responsibility for its maintenance;

The person with ultimate responsibility, should appoint a person/s in writing to take managerial responsibility and to provide supervision for the implementation of precautions.(ACOP L8 (Fourth Edition 2013), Para 48)

Responsible Person/s

Responsible for the day-to-day control of identified risk areas. They should have a clear understanding of their duties and of the overall Health and Safety structure and policy within the organisation. They should also ensure the competence of any contractors carrying out work. (ACOP L8 (Fourth Edition 2013), Para 48-51)

The Responsible Person should be a manager, director or have similar status and have sufficient authority, competence and knowledge to ensure the timely and efficient implementation of precautions. (ACOP L8 (Fourth Edition 2013), Para 51)

Authorised Deputies / Supervisors

Responsible for the supervision of staff engaged in relevant operational duties. Should ensure that correct procedures are followed and that deadlines are met. When a Responsible Person is not on site during working hours (e.g. night shifts), an Authorised Deputy should be appointed to maintain cover. (ACOP L8 (Fourth Edition 2013), Para 54)

Authorised Deputies and Supervisors should possess suitable experience, knowledge and personal qualities. They should receive initial training and regular refresher courses. (ACOP L8 (Fourth Edition 2013), Para 52)

Management Responsibilities

The 'Statutory Duty Holder' should appoint a 'Competent Person or Persons', with sufficient training to take day-to-day responsibility for controlling any identified risk from legionella bacteria.(ACOP L8 (Fourth Edition 2013), Para 51).

The implementation of all monitoring programmes and control schemes should be properly supervised. All members of staff should be clearly informed of their duties and responsibilities, and efficient lines of communication established to ensure that all relevant information is passed on quickly and accurately. (ACOP L8 (Fourth Edition 2013), Para 53)

Record Keeping

The Responsible Person/s designated by the Statutory Duty Holder should ensure that appropriate records are kept, including:

- Names and positions of people responsible, and their deputies, for carrying out the various tasks under the written scheme;
- A Risk Assessment and a written scheme of action and control measures;
- Detailed schematic diagrams of the water system;
- Details of precautionary measures that have been applied/implemented including enough detail to show that they were applied/implemented correctly, and the dates on which they were carried out;
- Remedial work required and carried out, and the date of completion;
- A log book detailing visits by contractors, consultants and other personnel;
- Cleaning and disinfection procedures and associated reports and certificates;
- Results of the chemical analysis of the water;
- Result of any biological monitoring;

The above records should be kept for at least two years following the end of the period for which they concern. (ACOP L8 (Fourth Edition 2013), Para 72) Records should also be kept regarding the systems use and the implementation of the written scheme. These records must be preserved for at least five years following the end of the period for which they concern and should include: (ACOP L8 (Fourth Edition 2013), Para 72)

- The date of completion and results from any inspections, testing or monitoring;
- Details of the state of operation of the system, the dates when elements were in use / not in use and, if not in use, whether they are drained down;

The person/s completing any task should sign and date the relevant records as evidence. (ACOP L8 (Fourth Edition 2013), Para 73).

Premises Monitoring and Maintenance

Water systems should be designed and operated to minimise the growth of legionella. They should be frequently used, well maintained, clean and properly insulated. Systems will pose a higher level of risk where they:

- Are infrequently maintained;
- Contain cold water tanks which are:
 - Dirty, lid-less and have unprotected overflow outlets;
 - Poorly insulated; or
 - In warm parts of the building;
- Contain pipework which is poorly insulated and carries infrequently used hot or cold water; e.g. lengths of pipes may contain lukewarm water for long periods;
- Infrequently used or faulty outlets resulting in water stagnation
- Are adapted/converted e.g. incorporating oversize cisterns or Calorifiers and unnecessarily long runs of pipe;
- Have Dead ends of redundant pipework which have not been removed as far as reasonably practicable;
- Contain materials / fittings which support the growth of legionella;
- Contain a hot water heater or storage tanks holding water below 50°C or not heating contents uniformly.

Measures must therefore be taken to reduce the risk that these conditions do not exist.

There are tasks that have been recommended by HSG274 Part 2 to monitor and maintain a site's water system and compliance with the guidelines is required by the HSE.

- Weekly flushing of **all, little or no use** outlets;
- Monthly Calorifier temperature monitoring/checks;
- Monthly water heater temperature monitoring;
- Monthly hot and cold water temperature monitoring (sentinel/representative outlets);
- Quarterly shower/spray head/spray taps check and de-scaling;
- Annual cold water storage tank inspections;
- Annual cold water storage tank temperature monitoring (summer);
- Annual outlet inspection & de-scale;
- Annual TMV inspection;

Weekly Flushing / Infrequently Used Outlets

To ensure fresh water supplies and to limit the risk of bacteria growth in the pipework system, the following actions should be taken in all locations where water services are not used for one week or more. Care should be taken when undertaking any flushing of outlets to ensure that contact with aerosol is reduced. Shower heads to be removed or flushed directly to drain, small cloths or towel over the outlet. Toilet seats to be down (where fitted) to ensure "toilet sneeze" is reduced. Monitoring of outlets should be undertaken to identify outlets that are not used frequently. These should be reviewed as necessary to ensure all infrequently used outlets are included in the programme.

On a weekly basis, where level of use is known to be unpredictable or intermittent, or after a predictable interval of a week without use:

Hot Water Services – Turn on hot water taps and run to waste. Then follow temperature monitoring guidelines as a minimum recommendation.

Cold Water Services – Turn on cold water taps and run to waste the initial tepid water. Then follow temperature monitoring guidelines as a minimum recommendation.

Showers – All types (whether cold water fed /electric, blended or TMV) must be thoroughly flushed through at full temperature for 2 minutes.

This is particularly important in schools and other educational establishments where there may be significant periods of time where they are not used; e.g. during the summer holiday or where occupancy reduces significantly for a period of time.

In some sites, consideration must be given to removing infrequently used taps and/or showers. If they are removed the redundant supply pipework should be cut back to source or as far as reasonably practicable.

Further information can be found in the procedure section.

Hot and Cold Water Temperature Monitoring

In hot and cold systems (storage tanks, pipework, taps and showers), the risk of legionella can largely be controlled by keeping the temperature of water outside of the limits of the favoured growth range. For hot water, the simplest and most effective control measure is to store hot water above 60°C and distribute it throughout the system above 50°C.

The table at Appendix 1 contains a schedule for precautionary checks, which the responsible person should organise to be carried out at the frequencies indicated. Where the temperatures fall outside the standards, further advice should be sought.

Monthly temperature checks

- (a) Sentinel Taps – For hot water services, the first and last taps on a re-circulating system. For cold water systems (or non-re-circulating 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.
- (b) Rotational Outlets – for both hot and cold water services rotational outlets should be included so that all outlets are included in the monitoring process during the course of a year.
- (c) The maximum temperature water utilities are permitted to supply water to premises is at temperatures up to 25°C. In practice it tends to be 5-10°C in winter and up to 20°C in the summer. During a prolonged hot summer, the incoming water temperature at some sites can become abnormally warm. If the incoming water temperature is above 20°C the water supplier should be advised to see if the cause of the high temperature can be identified and removed.

Checking the temperature from the hot taps:

Check the water flow from the hot tap identified as a sentinel outlet. Other representative points can then also be checked in a chosen pattern, eventually repeating the pattern so different taps are checked monthly.

The main points to note:

- Hold the thermometer in the hot water flow for one minute
- Record the temperature on the thermometer on the monitoring sheet (date and time should also be noted)
- It should be a minimum of 50°C after one minute of running

Where thermostatic mixing valves (TMVs) are fitted, the temperature should be monitored to prevent hot water scalding. The hot water flow to the TMV should be checked as well as the hot taps. The flow temperature should be a minimum of 50°C. You should use a temperature surface probe or a surface contact type thermometer. These work by measuring the surface temperature of the water supply pipes as close to the TMV as possible.

- Connect the temperature surface probe or a surface contact type thermometer to the pipework immediately before the TMV;

See guidance for TMVs for the temperature setting recommended by NHS guidelines.

Checking the temperature from Hot Water Cylinders / Calorifiers

On a monthly basis check the water flow and return (where applicable) temperatures at hot water cylinders / Calorifiers. A calibrated temperature gauge or a surface temperature probe should be used. The stored water / flow water should be at least 60°C.

Temperatures from cold taps:

Identified sentinel outlets should be monitored each month with different cold taps on a rotational basis each month:

- Hold the thermometer in the cold water flow for two minutes
- Record the temperature after two minutes
- It should be a maximum of 20°C or below

Where any out-of-scope water temperatures are recorded action should be taken to rectify the issue and records of the measures taken kept within the log book.

Every six months, you must also check the water temperature in the cold water storage tank:

- Check temperature at ball valve
- Check mains water temperature going into the tank
- Confirm and record temperatures as shown on the thermometer on the tank, if it has one
- See advice regarding inspections of cold water storage tanks

Keeping accurate records is important and it should be clear which taps or tanks were checked each time, where they are, who checked them, when they were checked, and anything that was out-of-scope and what was done to remedy it.

To take accurate temperature measurements, allow the water to run for the specified time (or a sufficient amount of time to ensure the water has reached the appropriate temperature).

- Cold water temperatures to be measured after 2 minutes of running water.
- Hot water temperatures to be measured within 1 minute of running water.
- Keep the water running (Hot >1 min / Cold >2min) until the temperature displayed has stabilised on the thermometer (maximum for Hot and lowest for Cold), then read the temperature.

Temperatures should be recorded in degrees Celsius (°C).

Quarterly Shower Heads and Hoses checks

The showerheads and hoses require the following precautions to be undertaken on a quarterly basis or as set out in the local cleaning regime:

- Dismantling, cleaning and descaling of shower heads and hoses;
- The shower head and hose should be refitted and flushed through to remove all traces of cleaning agent prior to the system being re-used.

Other systems:

Air Conditioning

Air conditioning is a process of treating air to control its temperature, humidity and cleanliness and distributing this air to meet the needs of the prescribed space.

Air conditioning units should be installed, used and maintained in accordance with the manufacturer's instructions. There must be a maintenance contract in place which includes cleaning.

Spa Baths

Spa baths are self-contained bodies of warm water circulating around users at approximately 30-40 °C. Spa baths are not usually drained between users so the water has to be continually filtered and cleaned.

Spa Baths may also be called spa pools, hot spa, hot tub, portable spa or whirlpool spa. Jacuzzi is the trade name of one type of spa.

There have been several outbreaks of Legionnaires' disease where the cause was traced back to a spa bath. People can be exposed while using the spa, but also just being close enough to breathe in the aerosol created e.g. during demonstrations.

Legionella is a particular risk in spa baths because:

- The water is normally stored at the optimum temperature for the bacteria to multiply;
- Particles of dirt, dead skin cells etc, from the people using the bath accumulate providing nutrients;
- The piping for the air and water circulation provide a large surface area for the bacteria to grow on; and
- The agitated water forms aerosols and spray via which the bacteria can be breathed in.

Persons responsible for managing spa baths need to ensure:

- A risk assessment is undertaken to identify and assess any potential sources of legionella, and to consider who and how people could be exposed;
- A plan is prepared to prevent or control any risks identified, which is implemented, managed and monitored;
- Records are kept of this work;
- Someone is appointed to manage this responsibility ;
- Staff are trained to correctly operate the spa bath giving them appropriate information about the risks and plans to control them.

The spa bath should be monitored at the following frequencies, and formal records must be kept:

Hot water issues – Vulnerable Groups

Where hot water comes out of taps at temperatures above 43°C there is a risk of scalding particularly to vulnerable groups such as young children, elderly people, people with disabilities and those with sensory loss who may not be able to respond quickly high temperature. This is especially a risk in care-related premises for whole body water contact in baths and showers. The risk from legionella must be considered by controllers of premises when designing control measures in relation to the risk of scalding.

A decision on the appropriate course of action will be made based on the needs of the users but may include:

- Warning signs (Caution Hot Water) adjacent to each tap may be sufficient for staff and visitors.
- Tactile/Braille warning signs if there are members of staff or anticipated visitors who suffer from visual impairment;
- Signs may need to be made available in other languages.
- Fitting of thermostatic mixing valves (TMV) if vulnerable people have access to hot taps, baths or showers.

If the above are not sufficient then further guidance should be sought.

Thermostatic Mixing Valves (TMV)

TMVs are valves that blend hot and cold water to produce a water temperature that safeguards against the risk of scalding, typically between 38°C and 46°C depending on outlet use. The blended water downstream of TMVs may provide an environment in which legionella can multiply, thus increasing the risks of exposure.

The use and fitting of TMVs should be informed by a comparative assessment of scalding risk versus the risk of infection from legionella. Where a risk assessment identifies the risk of scalding is insignificant, TMVs are not required. The most serious risk of scalding is where there is whole body immersion, such as baths and showers, particularly for the very young and elderly, and TMV's should be fitted at these outlets. (Legionnaires Disease Part 2 item 2.75)

Where TMV's are fitted the current standard is known as TMV3. (TMV2 and TMV1 continue to allow hot water to flow if cold water is cut off.) These need to be placed as close to the water outlet as possible to minimise the length of pipe containing water at a temperature liable to allow the bacteria to multiply.

Appendices 2-4 provide checklists and information regarding outlets and checks that should be performed and records kept

All TMV's need to be accessed easily and should have a servicing routine which should be carried out annually and take into account the manufacturer's recommendations. Temperature checks should be taken to ensure that they are set up correctly in accordance with guidelines.

Warning Signs

In addition to signs for Hot Water consideration should be given to labelling outlets to identify the water source, such as Drinking Water (for mains cold water) and Not Drinking Water (for water supplied by a cold water storage tank).



Important Notes

Legal Position

Although failure to adopt Health & Safety Executive guidelines contained within document L8 is not in itself a criminal offence, it is the responsibility of the Statutory Duty Holder to either follow such recommendations or to satisfy inspectors and / or a court that the relevant regulations have been complied with in some other way.

The Health & Safety Executive guidelines apply to the control of Legionella bacteria in any activity or premises controlled in connection with a business or other undertaking where water is stored or used and where there is a means of creating and transmitting water droplets which may be inhaled, causing a reasonably foreseeable risk of exposure to Legionella. (L8 (2013), Para 18)

Reviews

The Importance of Regular Reviews

The Risk Assessment should be reviewed regularly rather than 2 years and particularly if there are reasonable grounds to believe that it may no longer be valid. (ACOP L8 (Fourth Edition 2013), Para 32)

Regular reviews by competent persons should be carried out especially when there are changes in the use of rooms or outlets and toilets being out of order, even using a room with outlets for storage is a problem.

It is advisable to conduct an annual review of all monitoring programmes, control schemes, lines of communication and record keeping, in order to ensure that best practices are being maintained.

Regular risk assessment reviews and the adoption of effective procedures to prevent or control the risk will enable the Statutory Duty Holder to demonstrate that all pertinent factors have been properly considered. (ACOP L8 (Fourth Edition 2013), Para 32)

The assessment of risk is an ongoing process and not merely a paper exercise. Duty Holders should arrange to review the assessment regularly and specifically when there is reason to suspect it is no longer valid.

The need to review may result from:

- changes to the water system or its use;
- changes to the use of the building in which the water system is installed;
- or to the groups of people exposed to any potential risk
- the availability of new information about risks or control measures
- the results of check indicating that control measures are no longer effective
- changes to key personnel
- a case of Legionnaires Disease/Legionellosis associated with the system
- the introduction of new or amended legislation or codes of practice.

(L8 ACOP Para 47).

Note 2 from BS8580-1:2019 on reviews:

Water systems with higher inherent risk or complex water services where changes are poorly documented may need to be reassessed frequently, e.g. annually, whereas for water systems with a lower inherent risk or those where changes are recorded and where water systems are well managed, it may be sufficient for a formal reassessment to be performed every 2-5 years.

Record Keeping

To ensure that precautions continue to be carried out and that adequate information is available, a record of the assessment, precautionary measures and treatments should be kept.

All records should be signed and dated by those people performing the various tasks assigned to them.

All records must be kept for a minimum of 5 years (to meet the standards set out in the Approved Code of Practice).

If you have any enquiries regarding this guidance please contact Water Monitoring Ltd.

Company Name	Water Monitoring Limited
Company Address	Hales Farm (Entrance 1) High Cross Lane East Little Canfield Great Dunmow Essex CM6 1TQ
Telephone	01371 876228
E-mail Address	info@watermonitoringltd.co.uk
Website	www.watermonitoring.co.uk

Services Provided
<ul style="list-style-type: none"> • Legionella Risk Assessment • Legionella Control Advice and Management – advice on water sample results, control and management of Legionella risk for site and support on maintaining records • Water Tank- restoration & maintenance • Water Tanks Upgraded • Tank Replacement • Water Systems - cleaned & chlorinated • Water Systems Analysed - for Legionella & other bacterial growth • Calorifier - cleansing & maintenance

Area Manager/ Technical Representative	<p>Normal point of contact within the supplier's company. Direct line manager of Technical Representative. Also, responsible for holding yearly reviews with the client. Responsible for providing technical information and support.</p> <p>Specific responsibilities include:</p> <ul style="list-style-type: none"> • Routine monitoring of assets & water temperatures (as requested) • Laboratory analysis of water samples (as requested) • Water tank de-scaling, cleaning & disinfection (as requested) • Showerhead de-scaling, cleaning & disinfection (as requested) • Calorifier de-scaling, cleaning & disinfection (as requested) • System repair & refurbishment work (as requested)
Name	Mark Hogan
Contact Number	07737 147376
E-mail Address	mark@watermonitoringltd.co.uk

Appendix 1 Check List for hot and cold water systems

Service	Action to take	Frequency
<i>Calorifiers</i>	Inspect Calorifier internally by removing the inspection hatch or using a boroscope and clean by draining the vessel. The frequency of inspection and cleaning should be subject to the findings and increased or decreased based on conditions recorded	Annually, or as indicated by the rate of fouling
	Where there is no inspection hatch, purge any debris in the base of the Calorifier to a suitable drain. Collect the initial flush from the base of hot water heaters to inspect clarity, quantity of debris, and temperature	Annually, but may be increased as indicated by the risk assessment or result of inspection findings
	Check Calorifier flow temperatures (thermostat settings should modulate as close to 60°C as practicable without going below 60°C). Check Calorifier return temperatures (not below 50°C, in healthcare premises not below 55°C)	Monthly
<i>Hot Water Services</i>	For non-circulating systems: take temperatures at sentinel points (nearest outlet, furthest outlet and long branches to outlets) to confirm they are at a minimum of 50°C within one minute (55°C in healthcare premises)	Monthly
	For circulating systems: take temperatures at return legs of principal loops (sentinel points) to confirm they are at a minimum of 50°C (55°C in healthcare premises). Temperature measurements may be taken on the surface of metallic pipework.	Monthly
	For circulating systems: take temperatures at return legs of subordinate loops, temperature measurements can be taken on the surface of pipes, but where this is not practicable, the temperature of water from the last outlet on each loop may be measured and this should be greater than 50°C within one minute of running (55°C in healthcare premises) If the temperature rise is slow, it should be confirmed that the outlet is on a long leg and not that the flow and return has failed in that local area	Quarterly (ideally on a rolling monthly rota)
	All HWS systems: take temperatures at a representative selection of other points (intermediate outlets of single pipe systems and tertiary loops in circulating systems) to confirm they are at a minimum of 50°C (55°C in healthcare premises) to create a temperature profile of the whole system over a defined time period	Representative selection of other sentinel outlets considered on a rotational basis to ensure the whole system is reaching satisfactory temperatures for legionella control
<i>POU water heaters (no greater than 15 litres)</i>	Check water temperatures to confirm the heater operates at 50-60°C (55°C in healthcare premises) or check the installation has a high turnover	Monthly to six monthly, or as indicated by the risk assessment

Checklist Continued

Service	Action to take	Frequency
<i>Combination water heaters</i>	Inspect the integral cold water header tanks as part of the cold water storage tank inspection regime, clean and disinfect as necessary. If evidence shows that the unit regularly overflows hot water into the integral cold water header tank, instigate a temperature monitoring regime to determine the frequency and take precautionary measures as determined by the findings of this monitoring regime	Annually
	Check water temperatures at an outlet to confirm the heater operates at 55-60°C	Monthly
<i>Cold water tanks</i>	Inspect cold water storage tanks and carry out remedial work where necessary	Annually
	Check the tank water temperature remote from the ball valve and the incoming mains temperature. Record the maximum temperatures of the stored and supply water recorded by fixed maximum/minimum thermometers where fitted	Annually (Summer) or as indicated by the temperature profiling
<i>Cold water services</i>	Check temperatures at sentinel taps (typically those nearest to and furthest from the cold tank, but may also include other key locations on long branches to zones or floor levels). These outlets should be below 20°C within two minutes of running the cold tap. To identify any local heat gain, which might not be apparent after one minute, observe the thermometer reading during flushing	Monthly
	Take temperatures at a representative selection of other points to confirm they are below 20°C to create a temperature profile of the whole system over a defined time period. Peak temperatures or any temperatures that are slow to fall should be an indicator of a localised problem	Representative selection of other sentinel outlets considered on a rotational basis to ensure the whole system is reaching satisfactory temperatures for legionella control
	Check thermal insulation to ensure it is intact and consider weatherproofing where components are exposed to the outdoor environment	Annually
<i>Showers and spray taps</i>	Dismantle, clean and descale removable parts, heads, inserts and hoses where fitted	Quarterly or as indicated by the rate of fouling or other risk factors, e.g. areas with high risk patients
<i>POU filters</i>	Record the service start date and lifespan or end date and replace filters as recommended by the manufacturer (0.2 µ membrane POU filters should be used primarily as a temporary control measure while a permanent safe engineering solution is developed, although long-term use of such filters may be needed in some healthcare situations)	According to manufacturer's guidelines

Checklist Continued

Service	Action to take	Frequency
<i>Base exchange softeners</i>	Visually check the salt levels and top up salt, if required. Undertake a hardness check to confirm operation of the softener	Weekly, but depends on the size of the vessel and the rate of salt consumption
	Service and disinfect	Annually, or according to manufacturer's guidelines
<i>Multiple use filters</i>	Backwash and regenerate as specified by the manufacturer	According to manufacturer's guidelines
<i>Infrequently used outlets</i>	<p>Consideration should be given to removing infrequently used showers, taps and any associated equipment that uses water. If removed, any redundant supply pipework should be cut back as far as possible to a common supply (e.g. to the re-circulating pipework or the pipework supplying a more frequently used upstream fitting) but preferably by removing the feeding 'T'</p> <p>Infrequently used equipment within a water system (i.e. not used for a period equal to or greater than seven days) should be included on the flushing regime</p> <p>Flush the outlets until the temperature at the outlet stabilises and is comparable to supply water and purge to drain</p> <p>Regularly use the outlets to minimise the risk form microbial growth in the peripheral parts of the water system, sustain and log this procedure once started</p> <p>For high risk populations, e.g. healthcare and care homes, more frequent flushing may be required as indicated by the risk assessment</p>	Weekly, or as indicated by the risk assessment
<i>TMVs</i>	<p>Risk assess whether the TMV fitting is required, and if not, remove where needed, inspect, clean, descale and disinfect any strainers or filters associated with TMVs</p> <p>To maintain protection against scald risk, TMVs require regular routine maintenance carried out by competent persons in accordance with the manufacturer's instructions. There is further information in paragraphs 2.152 - 2.168</p>	Annually or on frequency defined by the risk assessment, taking account of any manufacturer's recommendations
<i>Expansion vessels</i>	Where practical, flush through and purge to drain	Monthly - six monthly, as indicated by the risk assessment

checklist as defined by HSG274 Part 2

Appendix 2 Checklist for recommended frequency of inspection for other risk system

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, de-scaling 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
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 Management of spa pools: Controlling the risks of infection	
Whirlpool baths	Clean, flush and disinfect air channels Remove, flush and clean jets	As indicated by risk assessment
Horticultural misting systems	Clean and disinfect distribution pipework, spray heads and make-up tanks including all wetted surfaces, de-scaling as necessary	Quarterly or as indicated by risk assessment

System/service	Task	Frequency
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 <i>Decontamination Health Technical Memorandum 01-05: Decontamination in primary care dental practices</i>	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
Fountains and water features	Clean and disinfect ponds, spray heads and make-up tanks including all wetted surfaces, de-scaling as necessary	As indicated by risk assessment , and depending on condition
Industrial process water system	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	Monitoring, inspection, and testing frequencies to be determined as indicated by the risk assessment
	Devise a control scheme based on this risk assessment	

checklist as defined by HSG274 Part 3

Appendix 3 Procedures

Cloth Method

The “cloth” method would be to cover the outlet or shower head with a cloth/towel (e.g. small hand towel) to reduce exposure to aerosol while undertaking flushing.

Infrequently used outlets

When flushing showerheads and taps that have not been used for 7 days or more it is the first flush of water that might be contaminated. Once this water has run through the risk is reduced. It is essential that staff avoid contact with aerosol produced from outlets during this first flush. The “cloth” method should be considered.

Showers

The following methods should be used to reduce exposure where the aerosol produced may pose a significant risk when flushing is carried.

Fixed Head: For single heads a bucket should be placed directly under the shower/spray head and held in place for a minimum of 2 minutes until full flow can be achieved (Hot >50°C / Cold <20°C). This reduces the production of aerosol. Or the cloth method could be considered -this can be used for multiple heads situations where the use of a bucket is un-practical (e.g. changing rooms/sports facilities). Again the showers should be run for several minutes until full flow achieved.

Flexible hoses head: Before commencing flushing the head should be removed from its bracket and pointed towards the bath, basin or shower tray waste. Turn water on slowly and flush as above for several minutes.

Taps

If not in use for a period of 7 days, run water from both hot and cold supplies, or warm if on a single mixer tap, through tap(s) for 2 minutes. Where spray head taps are present the “cloth” method should be used for flushing the outlet.

Shower/Spray Head Disinfection

Remove and disassemble the shower heads and flexible hoses from one another. De-scale the shower heads and flexible lines using a proprietary de-scaling agent for an hour or to manufacturer's instruction. Dispose of the water in an appropriate manner. Flush through with clean water before immersing in an approved biocide (Immersion in 50mg/l hypochlorite solution, or approved disinfectants that have an equivalent biocidal effect). Dispose of the water in an appropriate manner.

Or use a product such as ‘Showerhead+’ which is a descaling and sanitising solution for shower heads and plumbing fittings.

Where necessary replace soft rubber or plastic washers, gaskets or hose linings with neoprene or other WRC approved rubber substitutes.

Flush and wash the shower heads and flexible hoses through with clean water. Re-assemble and return shower heads to normal operating conditions and further flush for several minutes using normal system water.

Outlets

Descale outlets using a de-scaling agent to the manufacturer's instruction. Flush through with clean water before disinfecting using an approved disinfectant as per instructions above for shower/ spray heads.

Note: All staff carrying out the above procedures should be fully competent in using de-scaling/disinfecting agents. Under no circumstances should any de-scaling or acid products be mixed with any disinfecting agents because it creates a noxious gas which can result in respiratory problems. Product data/COSHH sheets should be available for all products used.