The Control of Legionella Bacteria in Water Systems - Policy and Procedures

Estates Facilities

Signed: 
Nick Roalfe
Director of Estates Facilities

Signed: 
Tim Killip
Head of Maintenance

May 2015
Imperial College Policy Statement

The College will take all reasonable precautions to ensure that its staff, students, contractors and visitors are not exposed to airborne Legionella bacteria from building services hot, cold or cooling water systems while on its premises.

This policy does not include those specialised water systems which may be installed within academic Departments and are the responsibility of the Faculties.

All new projects will be installed, commissioned and handed over in accordance with the HSE Approved Code of Practice L8 / HSG 274.

Introduction

Legionnaires’ disease is a potentially fatal illness caused by the inhalation of very small water droplets or aerosol which contains Legionella bacteria. The disease was first discovered in America in the 1970s after a number of people attending a convention became ill with influenza like symptoms.

In order to comply with its legal obligations the College is required to comply with the Health and Safety Commission Approved Code of Practice and Guidance L8 – Legionnaires’ disease: The control of Legionella bacteria in water systems which applies to hot, cold and cooling water systems and the guidance given in HSG 274 (Part 1, Part 2, and Part 3)

The approved code of practice imposes the following responsibilities on the College:–

1. Appoint members of staff to fulfill the following roles:–

   a. Duty Holder – the Duty Holder has overall responsibility for the control of premises.
   b. Responsible Person – the Responsible Person has the delegated responsibility for the implementation of the College’s policy and for the management of the water systems across the Estate in accordance with the Approved Code of Practice L8 / HSG274.
2. Identify and assess the sources of risk from the hot and cold water systems on each campus.

3. To have in place a system for managing the risks identified through either prevention or control measures.

4. Continually monitor water systems and implement agreed remedial measures where these become necessary to control the risk.

5. Maintain adequate records of maintenance, monitoring, testing, disinfection and pasteurisation of the water systems necessary to demonstrate compliance with the College's procedures and Approved Code of Practice L8/ HSG 274.

6. Training – all maintenance staff will be given training in the use of the Approved Code of Practice L8 / HSG 274. A copy of the Code of Practice will be issued to each Team Leader and Supervisor for reference by Team Members.

The responsibilities noted above will be implemented through the College's Estates Facilities Department approved maintenance procedures as follows:

**Procedures**

1. **Appointment of members of College Staff**

   **The Duty Holder** – The Director of Estates Facilities has been appointed as the Duty Holder in accordance with the Approved Code of Practice L8/ HSG274.

   **The Responsible Person** – The Head of Maintenance is delegated the responsibility of managing the College's water systems in accordance with the Approved Code of Practice L8/ HSG274.

2. **Identification and assessment of the risk**

   A survey will be completed by a competent person for all of the building services water systems in College premises e.g. cooling systems, mains water/cold water down service/hot water/economy
water on the South Kensington campus to include the pipework, taps, storage vessels/tanks, calorifiers, heat exchangers, showers etc which will identify, assess and record the risks to occupants of exposure to Legionella bacteria.

The survey will include the provision of a log book containing a schematic drawing detailing the building services hot and cold water systems in each building.

The survey will not include those specialist water systems installed within academic accommodation which are the responsibility of the Faculties.

A desk top review of the existing risk assessment shall be carried out every 2 years and where a significant change to system has been made then a full risk assessment will be carried out.

Any minor change made to the system will be assessed by the service provider at completion of works (e.g. tank replacement) and the records / risk assessment will be updated.

3. System for managing the risks.
The following measures have been agreed for the management and maintenance of the water systems to minimise the risk of Legionella bacteria colonisation.

i) Hot water services
   a. Calorifiers/heat exchangers – monthly, check flow and return temperatures. The flow temperature should be set to achieve 60 deg C. 12 monthly internal clean and disinfection.
   b. Sentinel taps – monthly, carry out temperature checks to confirm water reaches 50 degrees C within 1 minute
   c. Little used outlets – weekly, flush by user Department.
   d. Water taps – 12 monthly carry out temperature tests across a representative number of taps throughout each building to confirm water reaches 50 degrees C within 1 minute.

ii) Cold water services
   a. Sentinel taps – monthly, carry out temperature checks to confirm water is below 20 degrees C after 2 minutes.
b. Water tanks – 6 monthly, take sample of water for basic bacteriological testing (TVC/Coliforms/E.Coli), carry out inspection of the tanks and note temperatures remote from the ball valve. Annually, carry out deep clean and disinfection of the tanks.

c. Little used outlets – weekly, flush by user Department

d. Water taps – 12 monthly carry out temperature tests on a representative number of taps throughout each building to confirm that water is below 20 degrees C after 2 minutes.

iii) Showers – 3 monthly, dismantle, clean and descale shower heads and hoses.

iv) Emergency showers and eye wash sprays – 6 monthly, flush through to drain.

v) Spray humidifiers – 6 monthly, clean descale and disinfect spray humidifiers/air washers and make up tanks including all wetted surfaces.

vi) Water softeners – 12 monthly, clean and disinfect resin bed and brine tank.

vii) Cooling towers – Every Monday, Wednesday and Friday microbiological dip slides and basic water treatment tests including conductivity will be taken from every pond of each tower.

The dip slides will be incubated at 30 degrees C for a period of 2-3 days. If a dip slide indicates a bacterial level of greater than $10^5$ colony forming units the emergency procedures detailed in Appendix 1 of this policy and procedures document will be implemented.

At each service visit to take dip slides and inspection will be carried out on the water treatment plant. Adjustments will be made to maintain satisfactory water conditions as necessary. Any defects found will be reported to the Estates Facilities Customer Services Centre on extension 48000.

2 weekly – a water sample will be taken from each cooling tower by an independent water quality consultant to undertake
30 degrees C plate counts.

Monthly – a water sample will be taken from each cooling tower by an independent water quality consultant and analysed for Legionella bacteria.

6 monthly - each tower will be cleaned and disinfected.
12 monthly - deep clean/disinfection which will include the removal and cleaning of the pack.

4. Monitoring of water systems.
   i) An independent qualified water quality consultant will carry out the following tests on the water systems at the intervals specified.

   a. Monthly – the consultant will progress a rolling programme of annual water tests for each building. Two samples are taken from each of the hot and cold water systems and one sample from the drinking water system. The samples are sent to an independent laboratory to be tested for Legionella and bacteria (coliforms etc). Any samples which are found to be outside of the control limits are notified to the Head of Maintenance for corrective action.

   ii) An independent qualified water quality consultant will audit the following at the intervals specified and will provide a written report of his findings to the Head of Maintenance.

   b. 3 monthly – the consultant will review the water treatment, maintenance regime and records for all of the cooling towers and water systems undertaken by the measured term maintenance contractor.

   c. 3 monthly – the consultant will carry out a general inspection of the external and internal condition of each of the cooling towers, inspect the drift eliminators, review the schematic drawing and inspect the log book to ensure the records are being kept up to date, noting any departures from the control limits.
d. 3 monthly – the consultant will take water samples from each of the cooling tower ponds for analysis by an independent laboratory. Any samples that are found to be outside of the control limits are notified to the Head of Maintenance and emergency corrective actions taken.

5. Maintain adequate records of maintenance, monitoring, testing, disinfection and pasteurisation of the water systems necessary to demonstrate compliance with the College’s procedures and Approved Code of Practice L8/ HSG 274.

a. Copies of the risk assessments for each of the buildings will be kept by the Head of Maintenance and a desk top review shall be carried every 2 years or sooner where the need dictates.

b. Maintenance records for the cooling towers and water systems are maintained by the Measured Term Maintenance contractor and these are audited on a 3 monthly basis.

c. Copies of the 3 monthly audit reports completed by the independent qualified water consultant are retained by the Head of Maintenance.

d. A record of all maintenance activities, pasteurisations and tank cleaning etc is retained on the FSI Concept planned maintenance and defect control system operated by the Estates Facilities Customer Services Centre.
Appendix 1.

Emergency procedures
The following emergency procedures will be implemented where there is a departure from the control limits for calorifiers, water tanks, water systems or cooling towers:

**Cooling Towers – Poor dip slide result (>10⁵) cfu/l**
- Dump half volume of water held within the cooling system.
- Shot dose with biocide.
- Resample.

**Cooling Tower – Poor Legionella result**
- Drain entire cooling tower water system.
- Refill and chlorinate.
- Resample.

**Domestic Hot water – Poor Legionella result**
- Cease use of showers and any spray outlets.
- Pasteurise hot water system by raising hot water temperature within the entire calorifier to 70°C.
- Flush through outlets starting from the nearest, through the entire system.
- Reset calorifier to 60°C.
- Resample.

**Domestic Cold water – Poor Legionella Result**
- Cease use of showers and any spray outlets.
- Chlorinate entire cold water system.
- Resample.
Imperial College London
Legionella Policy - Management Structure
Water Scientific Escalation Process

ICL External Auditor
Girish Mistry
Water Scientific Ltd
Tel:- 0118 9453078

3 Monthly L8 Compliance Audit of SPIE Contract

Report / Log any serious defects to FM Helpdesk for Spie Contract

Also inform Spie Operation Manager & Compliance Manager

Notify Contract Manager - Rak Patel

If not resolved within timeframe then escalate to Head of Maintenance - Tim Killip

If not compliant then escalated to FM Director Nick Roalfe