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Newcastle University

The Control of Legionella Bacteria in Water Systems

Policy and Procedures

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Contents

1.0 Summary

1.1 The purpose of this document

This document forms part of the University Safety Policy and defines how we will identify and manage the risks arising from exposure to Legionella bacteria in water systems.

The policy applies to all areas of the University estate without exception.

University employees working in buildings owned and operated by others will be subject to the policy of the Landlord or Duty Holder for that building.

1.2 The Risk

1.2.1 Legionnaires' disease is a potentially fatal form of pneumonia which can affect anyone, but principally affects those who are susceptible because of age, illness, immunosuppression, smoking etc. It is caused by the bacterium *Legionella Pneumophila* and related bacteria. Legionella bacteria can also cause less serious illnesses which are not fatal or permanently debilitating. The collective term used to cover the group of diseases cause by Legionella bacteria is Legionellosis.

1.2.2 Legionnaires disease is normally contracted by inhaling Legionella bacteria, in tiny droplets of water (aerosols), deep into the lungs; there is no documented evidence of the disease passing from person to person.

1.2.3 The bacterium *Legionella pneumophila* and related bacteria are common in natural water sources such as rivers, lakes and reservoirs, but usually in low numbers.

Since Legionella bacteria are widespread in the environment, they may also contaminate and grow in purpose-built (man-made) water systems such as cooling towers, evaporative condensers and, hot and cold water systems.

The favourable conditions created in man-made water systems causes Legionella bacteria to multiply, increasing the risk that human exposure to the bacteria will occur.

Whilst everyone is susceptible to infection some people are at higher risk including:

- People over 45 years of age
- Smokers and heavy drinkers
- People suffering from chronic respiratory disease, and
- Anyone with an impaired immune system

1.3 Sources of Risk

The principal sources of risk within the University are;

Hot and cold water services within buildings
Evaporative cooling systems
Safety showers
Eye wash stations
Fire fighting and hose reel systems
Horticultural misting systems
Evaporative cooling towers
Scientific and other equipment temporarily or permanently connected to the water system.

This list is not exhaustive.

1.4 Summary of Legal Requirements

Under health and safety law, we have to consider the risks arising from exposure to legionella that may affect staff, students, members of the public or others and implement suitable precautions to manage and control these risks.

As an employer or a person in control of the premises (eg a landlord), we must:

- 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 persons to be managerially responsible, referred to as the 'responsible person'
- keep records and check that what has been done is effective
- notify the local authority that we have a cooling tower on site.

1.5 Management and Control of Risks

Because potential sources of risk at the University are so numerous and varied, the control and management of the risk becomes a task requiring University wide coordination and effort.

A Strategic Water Safety Group Chaired by Assistant Director of HR (Health and Safety) and made up of representatives from all University Faculties and appropriate Services has been established to provide a forum for communication/consultation and to oversee the development and implementation of the policy. (See Appendix 7)

Responsibility for managing and controlling risks will be assigned to designated employees in each appropriate Unit.

2.0 Policy Statement

Newcastle University recognises its responsibilities, under the Health and Safety at Work Etc Act 1974 and the Control of Substances Hazardous to Health Regulations 2002, to take all reasonable precautions to prevent or control the risks to staff, students and others from exposure to Legionella bacteria.

The University will provide the necessary resource and maintain appropriate management systems and controls in order to fulfil its commitment to health and safety.

The guiding principles of control are set out in the HSC publication "Legionnaires' Disease: The control of Legionella bacteria in water systems – Legionella Approved Code of Practice (ACOP L8)

The Duty Holder is the Vice Chancellor, Newcastle University

The University will do all that is reasonably practicable to comply with the requirements of this policy

Clare Rogers
Director of Estate Support Service
Newcastle University
Date: October 2012

3.0 Roles and Responsibilities

3.1 The hierarchy of responsibility for the management of health and safety within the University is documented in the University Safety Policy

3.2 Council have appointed the Vice Chancellor as the Duty Holder (Legionella) and a number of nominated Responsible Persons (Legionella) each with clearly defined roles and responsibilities.

3.3 Executive Board have appointed a member of the School of Mechanical and Systems Engineering as nominated responsible person for the cooling tower.

3.4 The diagram below (3.5), shows the Legionella management structure in simplified form for clarity.

3.4.1 Estate Support Service are responsible for managing and controlling Legionella bacteria in the University's hot and cold domestic water system to the outlet/point of use.

Responsibility for managing and controlling Legionella risks in University Units starts at the outlet and extends to all Unit owned equipment containing water

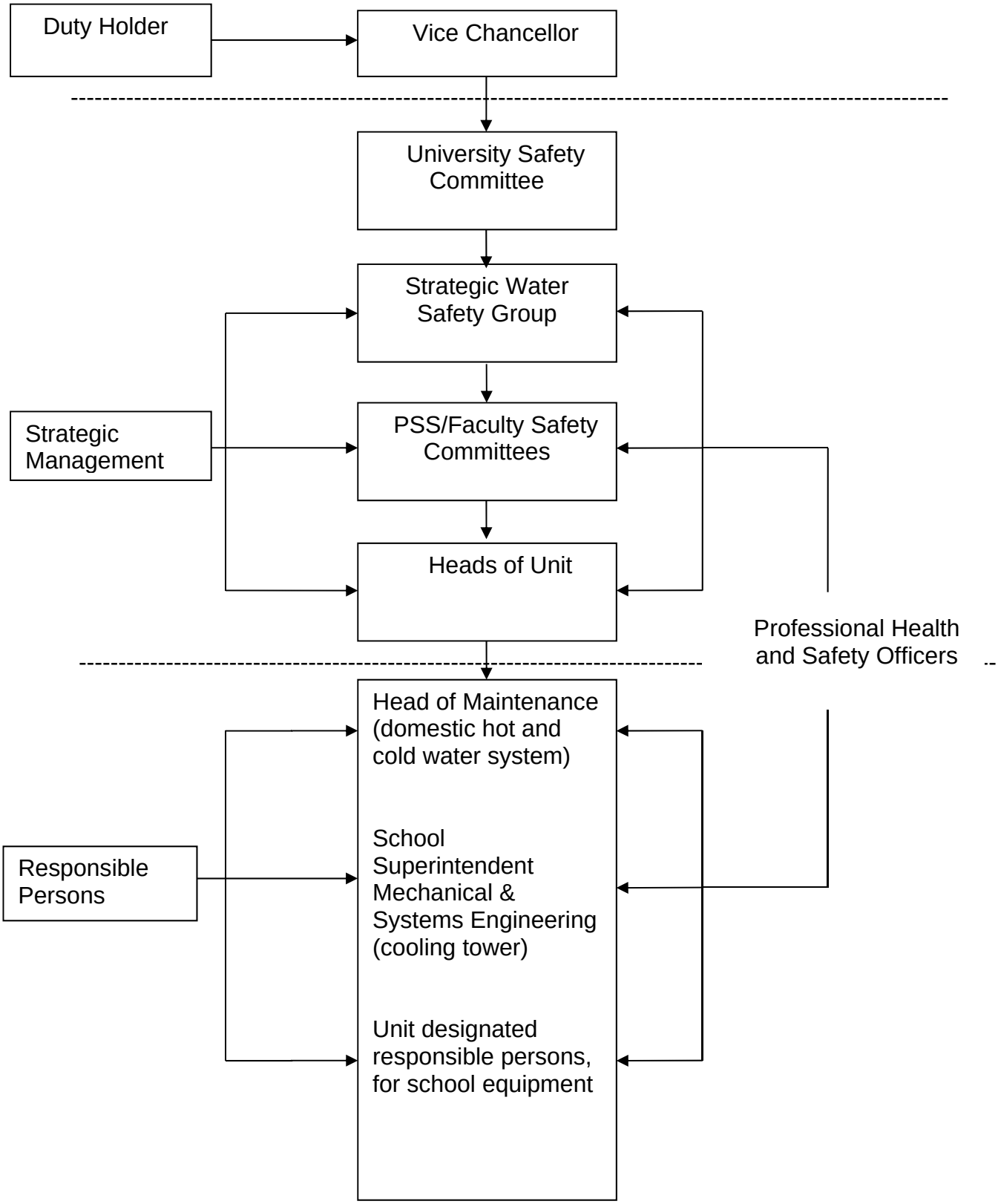
3.4.2 The **'Responsible Person'** is defined as being someone with day-to-day responsibility for controlling any identified risk from Legionella bacteria.

The appointed "*Responsible Person*" should be a manager, director, or have similar status and sufficient authority, competence and knowledge of the installation to ensure that all operational procedures are carried out in a timely and effective manner. They should also have a clear understanding of their duties and the overall health and safety management structure and policy in the organisation.

3.4.3 **Accountable Persons** are those persons given specific duties by the appointed *Responsible Person* for the control of Legionella risks in the water systems they are responsible for managing. For example an *Accountable Persons* may be given the duty of flushing infrequently used outlets and maintaining a log.

3.4.4 **Infrequently Used Outlet**, is a term used to describe a domestic water outlet that is not used at least once a week for a minimum period of two minutes eg emergency showers, toilets or sinks in redundant or little used parts of buildings.

3.5 Management of Legionella Organisation Chart



3.6 **The Vice Chancellor: Duty Holder (Control of Legionella bacteria).**

a) Holds overall responsibility for all aspects of the quality and management of water supplies within the University's buildings

b) Will appoint suitably qualified persons to manage the necessary procedures for the prevention and control of Legionella

3.7 **Head of Safety (Chair of Strategic Water Safety Group)**

a) Management responsibility for ensuring University-wide governance and management systems are in place for control of Legionella including appropriately trained responsible persons, policy, monitoring and addressing compliance.

b) Ensure the Strategic Water Safety Group monitors the application of the policy and addresses any non compliance issues within the remit of the appropriate manager

c) Ensure the Strategic Water Safety Group reviews this policy every two years.

d) Ensure the Strategic Water Safety Group reports to University Health & Safety Committee annually

3.8 **The Director of Estate Support Service: Nominated Responsible Person (Control of Legionella bacteria).**

a) Accept management responsibility for the control of Legionella bacteria within hot and cold water systems up to the point of use

b) Prepare and implement an operational policy for the control of Legionella bacteria within water distribution systems installed in University premises.

3.9 **The Head of Maintenance, Estate Support Service: Nominated Responsible Person (Operational Systems).**

a) Implement and maintain the University's planned preventative maintenance system for the control of Legionella bacteria within operational water distribution systems installed in University premises.

b) Ensure that persons carrying out Legionella risk assessments, monitoring and remedial works to operational systems are suitably qualified and competent to do so.

c) Ensure records of risk assessments and precautions are maintained.

d) Put in place arrangements for reporting an outbreak or suspected outbreak of legionnaires disease.

e) Ensure that the measures for monitoring and controlling the risks associated with Legionella are audited annually.

f) Prepare regular quarterly reports for the Estate Support Service Health and Safety Management Group on the efficacy of the control of Legionella management system.

3.10 The Head of Capital Development, Estate Support Service: Nominated Responsible Person (Capital Developments).

a) Accept management responsibility for the control of Legionella bacteria within systems, at outlets and from equipment within designated capital project areas.

b) Ensure any new system design or modification complies with Legionella Approved Code of Practice (ACOP L8)

c) Implement and maintain a system for the control of Legionella bacteria within designated capital project areas.

d) Ensure that persons carrying out Legionella risk assessments, monitoring and remedial works to systems, outlets and equipment within designated capital project areas are suitably qualified and competent to do so.

e) Ensure that the measures for monitoring and controlling the risk within designated capital project areas are monitored, reviewed and revised as necessary.

3.11 The Head of Improvements, Estate Support Service: Nominated Responsible Person (Improvement Projects).

a) Accept management responsibility for the control of Legionella bacteria within systems, at outlets and from equipment within designated Improvement project areas

b) Ensure any new system design or modification complies with Legionella Approved Code of Practice (ACOP L8)

c) Implement and maintain a system for the control of Legionella bacteria within designated Improvement project areas

d) Ensure that persons carrying out Legionella risk assessments, monitoring and remedial works to systems, outlets and equipment within designated Improvement project areas are suitably qualified and competent to do so

e) Ensure that the measures for monitoring and controlling the risk within designated Improvement project areas are monitored reviewed and revised as necessary

3.12 Professional Health and Safety Officers

a) Advise and assist with all safety related matters

b) Monitor application of the policy

c) Report any incidents under RIDDOR

d) Ensure systems are implemented to ensure all members of staff are suitably qualified and/or receive appropriate training

3.13 Maintenance Officer Engineering, Control of Legionella Contracts Manager

a) Produce a tender specification for water hygiene contracts

b) Arrange tender analysis with appropriate assistance

c) Act as the initial point of contact between the University and the water hygiene service provider

d) Arrange and chair monthly progress meetings with the water hygiene service provider and produce progress reports.

e) Report any issues or concerns to the Head of Maintenance/ESS Health & Safety Management Group by exception

f) Resolve any contractual disputes with the water hygiene service provider

g) Carry out Maintenance Officers duties in order to comply with the University control of Legionella bacteria in water policy and Legionella Approved Code of Practice (ACOP L8)

3.14 Maintenance Officers/AHS Maintenance Chargehand

a) Ensure compliance with the University control of Legionella bacteria in water policy and Legionella Approved Code of Practice (ACOP L8)

b) Ensure any remedial works identified in risk assessments or as a result of monitoring and testing are prioritised and carried out.

c) Ensure the monitoring regime is adhered to.

d) Ensure the testing regime is adhered to

e) Identify the costs of remedial works and ensure that sufficient funds are available to carry the work out

f) Order works from service providers or direct works organisation as required

g) Ensure works are completed within timescale and that all documentation is completed as necessary

h) Ensure risk assessments are updated as required by Legionella Approved Code of Practice (ACOP L8)

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i) Ensure any new system design or modification complies with Legionella Approved Code of Practice (ACOP L8)

3.15 Design Engineers, Surveyors, Project Managers and Project Engineers

a) Ensure compliance with the University control of Legionella bacteria in water policy and Legionella Approved Code of Practice (ACOP L8)

b) Ensure systems are designed in accordance with Legionella Approved Code of Practice (ACOP L8)

c) Ensure systems are installed in accordance with Legionella Approved Code of Practice (ACOP L8)

d) Ensure all documentation is completed, returned and that risk assessments have been provided or updated as required by Legionella Approved Code of Practice (ACOP L8)

3.16 Direct Works / Residences Supervisors, Operatives and Operators

a) As instructed, carry out any maintenance tasks required to ensure compliance with the University control of Legionella bacteria in water policy and Legionella Approved Code of Practice (ACOP L8)

b) Respond to requests for remedial works and report completion

c) Ensure any ‘in house’ installation work complies with Legionella Approved Code of Practice (ACOP L8)

d) Facilitate monitoring and inspection visits by water hygiene service providers

e) Ensure all necessary documentation is completed and returned

3.17 Heads of Unit

a) Ensure compliance with the University control of Legionella bacteria in water policy and Legionella Approved Code of Practice (ACOP L8)

b) Ensure unit owned equipment that contains water and which is temporarily or permanently connected to the domestic water system has been risk assessed and that suitable controls have been implemented to minimise the risk of exposure to Legionella bacteria

c) Ensure all water systems under their control are tested, inspected and monitored and that all necessary remedial works are carried out as required

d) Ensure that all infrequently used water systems eg emergency showers, toilet and bathroom facilities, eye wash stations and other water systems as identified by risk assessment, are regularly flushed in accordance with procedures to control risks arising from stagnant water. Ensure suitable records of the flushing regime are maintained on site

e) Ensure that no alterations or additions to water systems are carried out without the approval of Estate Support Service staff.

3.18 Residence Managers, Catering and Accommodation Managers Technicians and Operators

a) Ensure compliance with the University control of Legionella bacteria in water policy and the Legionella Approved Code of Practice L8

b) Ensure unit owned equipment that contains water and which is temporarily or permanently connected to the domestic water system has been risk assessed and that suitable controls have been implemented to minimise the risk of exposure to Legionella bacteria

c) Ensure all water systems under their control are tested, inspected and monitored and that all necessary remedial works are carried out as required

d) Ensure that all infrequently used water systems eg emergency showers, toilet and bathroom facilities, eye wash stations and other water systems as identified by risk assessment, are regularly flushed in accordance with procedures to control risks arising from stagnant water. Ensure suitable records of the flushing regime are maintained on site

e) Ensure that no alterations or additions to water systems are carried out without the approval of Estate Support Service staff.

f) In the event that a sample is returned outside the normal parameters then the Head of Maintenance, Assistant Director of HR (Health and Safety) and ESS Health and Safety Officer should all be informed, emergency procedures will then be invoked as necessary, this may include notifying residents, isolating and segregating services etc

3.19 School of Mechanical and Systems Engineering: nominated responsible person (cooling tower equipment)

a) Ensure compliance with the University control of Legionella bacteria in water policy and Legionella Approved Code of Practice (ACOP L8)

b) Ensure compliance with "The Notification of Cooling Towers and Evaporative Condensers Regulations 1992"

c) Arrange risk assessments, monitoring, testing and any remedial works identified to the school equipment linked to the cooling tower system

d) Keep records of servicing and maintenance of the cooling tower and of any system linked to the tower

e) Notify the local authority of the status of the cooling tower.

f) Report any incidents under RIDDOR via the school safety management system or by the University safety office

3.20 Water Hygiene Services Provider

a) Deliver a comprehensive water hygiene and control of Legionella bacteria service to ensure the University complies with Legionella Approved Code of Practice (ACOP L8)

b) Carry out routine testing, monitoring, flushing and cleaning of all systems on a regular basis as agreed in the contract specification

c) Update existing risk assessments on all properties at least once during the contract tenure (3 years)

d) Provide a water hygiene and control of Legionella bacteria records management system which complies with the regulations and Legionella Approved Code of Practice (ACOP L8)

e) Agree and implement a prioritised, corrective actions system with University Maintenance Officers and monitor response to alerts

f) Attend monthly meetings with Control of Legionella Contracts Manager to report progress and highlight any concerns

4.0 Identification and Assessment of the Risk

4.1 Newcastle University premises and equipment are classified in one of three categories which are:

Category 1 **High Risk**

Cooling Towers / evaporative condensers

The School of Mechanical and Systems Engineering currently operate one evaporative cooling tower in order to provide cooling to equipment within the Gear Research Laboratory of the Design Unit.

Category 2 **Medium Risk**

Large residential or academic premises incorporating stored or mains fed cold water systems, and hot water supplied via storage calorifiers with pumped distribution and recirculation.

Category 3 **Low Risk**

Small buildings incorporating pressurised hot water systems. Small buildings or domestic residences incorporating mains fed cold water and gravity fed hot water systems without recirculation.

4.2 Risk Assessment

Newcastle University will employ suitably qualified and competent persons to carry out a risk assessment of every building, the assessment will comply with the BS8580 2010 Water Quality, Risk Assessments for Legionella Control, Code of Practice and the HSC publication “Legionnaires’ disease : The control of Legionella bacteria in water systems – Legionella Approved Code of Practice (ACOP L8)

- Risk assessments will be reviewed every two years, and reassessed every three years, reviews will also take place when:
- There are changes to the water system or its use;
- There are changes to the use of the building in which the water system is installed;
- New information about risks or control measures becomes available;
- The results of checks indicating that control measures are no longer effective;
- A case of legionnaires’ disease/legionellosis is associated with the system.

In new buildings, whoever designs, manufactures, imports or supplies water systems that may create a risk of exposure to Legionella bacteria should, so far as reasonably practicable;

a) Ensure that the water system is so designed and constructed that it will be safe and without risks to health when used at work;

b) Provide adequate information for the user about the risk and measures necessary to ensure that the water systems will be safe and without risks to health when used at work

This will take the form of a risk assessment which will be provided at practical completion or handover.

5.0 Controlling and Monitoring the Risk

5.1 Newcastle University will employ suitably qualified and competent persons to implement a control and monitoring scheme for all potential sources of risk.

5.2 The company employed to carry out assessment; monitoring and control will be a member of an accredited body ie The Legionella Control Association.

5.3 Newcastle University ESS will introduce and retain an electronic water system logbook for each building which will contain records of control measures adopted. The electronic system is maintained and provided by the Water Hygiene service provider.

The Water System logbook will contain the following:

The Risk Assessment
Schematic diagrams of the systems
A written scheme for controlling the risk of exposure to Legionella
Records of control checks
Chlorination certificates and records
Records of any remedial works carried out
COSHH data regarding any chemicals used for dosing water systems or cooling towers
Details of management responsibilities

5.4 University (units) schools, services and institutes will ensure that departmental equipment is serviced (to include inspection, cleaning and disinfection) and maintained to the standard required to control Legionella bacteria within the University. Individual University Units will ensure records of servicing and maintenance are retained along with a log detailing flushing regimes (See Appendix 3).

5.5 Audits of the management system and associated records will be carried out annually by a suitably qualified and independent water hygiene service provider

5.6 Newcastle University adopts a temperature and flushing regime for Legionella control in water systems and uses biocides in the cooling tower system.

5.7 University Units must maintain and keep records of flushing regimes for infrequently used outlets e.g. during holiday periods.

6.0 Training and Competence

6.1 All appropriate staff will receive training and instruction commensurate with their level of responsibility where necessary from accredited training providers.

6.2 It will be the duty of the Head of Safety to identify appropriate levels of information instruction and training for duty holders identified in this policy

6.3 Duty Holders and Nominated Responsible Persons will receive further training in the role of the responsible person

6.4 Refresher training will be provided in accordance with Unit training matrices

Appendix 1

Applicable Regulations

The Health and Safety at Work Etc Act 1974

Duties under this act extend to risks from Legionella bacteria which may arise from the workplace or work activities.

The Management of Health and Safety at Work Regulations 1999

This act provides a broad framework for controlling health and safety at work. As well as requiring risk assessments, they also require employers to have access to competent help in applying the provisions of health and safety law.

The Control of Substances Hazardous to Health 2002

The COSHH regulations provide a framework of actions designed to control the risks from a range of hazardous substances including biological agents

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR)

These regulations require employers and others eg the person who has control of the work premises, to report certain injuries, diseases and dangerous occurrences arising from work or the workplace to the HSE.

The Notification of Cooling Towers and Evaporative Condensers Regulations 1992.

These regulation require those who have, to any extent, control of premises, to notify the local authority in writing with details of any ‘notifiable devices’

The Safety Representative and Safety Committee Regulations 1977 and the Health and Safety (Consultation with Employees) Regulations 1996.

These regulations require employers to consult trade union safety representatives, other employee representatives or employees where there are no representatives about health and safety matters.

Appendix 2

Glossary

Aerosol	A suspension in a gaseous medium of solid particles, liquid particles or solid and liquid particles having negligible falling velocity.
Air-conditioning	A form of air treatment whereby temperature humidity and air cleanliness are all controlled within limits determined by the requirements of the air-conditioned enclosure.
Calorifier	An apparatus used for the transfer of heat to water in a vessel by indirect means, the source of heat being contained within a pipe or coil immersed in the water.
Cold water service (CWS)	Installation of plant, pipes and fitting in which cold water is stored, distributed and subsequently discharged.
Cooling tower	An apparatus through which warm water is discharged against an air stream; in doing so part of the water is evaporated to saturate the air and this cools the water. The cooler water is usually pumped to a heat exchanger to be reheated and recycled through the tower.
Domestic water services	Hot and cold water intended for personal hygiene, culinary, drinking water or other domestic purposes.
Evaporative cooling	A process by which a small portion of a circulating body of water is caused to evaporate thereby taking the required latent heat of vaporisation from the remainder of the water and cooling it.
Final Outlet	A tap or device in the system from where water is taken.
Hot water service (HWS)	Installation of plant, pipes and fittings in which water is heated, distributed and

	subsequently discharged (not including cold water feed tank or cistern).
Legionella	Type of aerobic **bacterium** which is found predominantly in warm water environments, (singular of **Legionellae)**.
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.
Thermostatic mixing valve	Mixing valve in which the temperature at the outlet is pre-selected and controlled automatically by the valve.
Risk assessment	Indentifying and assessing the risk from **legionellosis** from work activities and water sources on premises and determining any necessary precautionary measures.
Water Distribution System	Infrastructure including tanks, pipes and equipment excluding the **final outlets**.

Appendix 3

Flushing Regime Log

Where infrequently used outlets have been identified this log must be completed by the nominated person on a weekly basis and retained for a minimum of 3 months

Building Name	Room No	Date of Flushing	Duration of Flushing (2 mins)	Signature

Appendix 4

Emergency Management Procedures

In the event of a confirmed outbreak of Legionnaires Disease the following procedure has been extracted from ACOP L8 and must be implemented immediately.

The Strategic Water Safety Group will be convened and the University Emergency Management Team informed.

1 Legionnaires Disease is not notifiable under public health legislation in England and Wales

2 An outbreak is defined by the Public Health Laboratory Service (PHLS), as two or more confirmed cases of Legionellosis occurring in the same locality within a six-month period. Location is defined in terms of the geographical proximity of the cases and requires a degree of judgement. It is the responsibility of the *Proper Officer* for the declaration of an outbreak. The *Proper Officer* is appointed by the local authority under public health legislation and is usually a Consultant in Communicable Disease Control (CCDC). In Scotland, it is the Consultant in Public Health Medicine (CPHM) employed by the Health Board and acting as Designated Medical Officer for the local authority.

3 Local authorities will have established incident plans to investigate major outbreaks of infectious disease including Legionellosis. These are activated by the *Proper Officer* who invokes an Outbreak Committee, whose primary purpose is to protect public health and prevent further infection. This will normally be set up to manage the incident and will involve representatives of all the agencies involved. HSE or the local authority Environmental Health Officer (EHO) may be involved in the investigation of outbreaks, their aim being to pursue compliance with health and safety legislation.

4 The local authority, CCDC or EHO acting on their behalf (often with the relevant officer from the enforcing authorities - either HSE or the local authority) may make a site visit.

5 As part of the outbreak investigation and control, the following requests and recommendations may be made by the enforcing authority.

a) To shut down any processes which are capable of generating and disseminating airborne water droplets and keep them shut down until sampling procedures and any remedial cleaning or other work has been done. Final clearance to restart the system may be required.

b) To take water samples (see paragraphs 124-131, Part 2) from the system before any emergency disinfection being undertaken. This will help the investigation of the cause of the illness. The investigating officers from the local authority/ies may take samples or require them to be taken.

c) To provide staff health records to discern whether there are any further undiagnosed cases of illness, and to help prepare case histories of the people affected.

d) To co-operate fully in an investigation of any plant that may be suspected of being involved in the cause of the outbreak. This may involve, for example:

i) tracing of all pipework runs
ii) detailed scrutiny of all operational records
iii) statements from plant operatives and managers
iv) statements from water treatment contractors or consultants.

6 Any infringements of relevant legislation, may be subject to a formal investigation by the appropriate enforcing authority.

Appendix 5

Emergency cleaning and disinfection procedure for cooling towers

If a cooling water system has been implicated in an outbreak of Legionnaires' disease emergency cleaning of that system has to take place as soon as possible. The following actions should be taken, where appropriate:

a) switch off the fan immediately;
b) take samples for laboratory investigation before any further action;
c) switch off the circulation pump as soon as is practicable and the system decommissioned;
d) consult the enforcing authority before proceeding further;
e) keep all personnel clear of the tower area;
f) when cleared by the enforcing authority, add sodium hypochlorite to the system water to obtain a measured concentration of 50 mg/1 of free chlorine;
g) circulate the system water with the fans off for a period of at least six hours;
h) maintain the free chlorine level at an absolute minimum of 20 mg/1at all times;
i) use a suitable biodispersant;
j) after six hours, de-chlorinate and drain the system;
k) undertake manual cleaning of the tower, sump, and distribution system with cleaning staff wearing fully pressurised respirators;
l) refill with fresh water, add sodium hypochlorite;
m) recirculate without using the fan, at 20 mg/1 of free available chlorine for six hours;
n) de-chlorinate and drain the system;
o) refill, recirculate and take samples for testing:
p) re-commission system when test results detect no Legionella and/or permission is granted by the enforcing authority.

If a water system other than a cooling system is implicated in an outbreak of Legionnaires' disease, emergency treatment of that system should be carried out as soon as possible.

Appendix 6

Monitoring and Maintenance Program and Procedures

1 Monitoring and Maintenance Program (Water Hygiene Services Provider)

The Water Hygiene Services Provider will implement a comprehensive monitoring and maintenance program throughout the University estate which will consist of the following routines:

2 Monthly

Check operating temperatures of all domestic hot water calorifiers throughout the University estate. Record the date, temperature on the calorifier gauge and the temperature taken at the nearest draw off point in an electronic data base access to which is to be available to the University.

Notify the Estate Support Service by email of any calorifier storing water at <60oC or any outlet not reaching 50oC after 1 minute.

As far as is reasonably practicable temperatures should be taken at times to avoid peak demands. Past experience has shown the best times are late morning (after1030) and late afternoon (after 1500).

3 Quarterly

Carry out monthly routines as detailed in paragraph 2 (above)

Take cold water temperatures at sentinel points and record in an electronic data base, access to which is to be available to the University.

Blow down domestic hot water calorifiers to remove any accumulated sludge.

Take hot water temperatures at sentinel points and record in an electronic data base access to which is to be available to the University.

Notify The Estate Support Service by email of any hot water outlet which does run above 50 degrees C after one minute.

Notify The Estate Support Service by email of any cold water outlet which does not run below 20 degrees C after two minutes.

Clean and Disinfect shower heads as listed in paragraph 11 (below)

Record the date of disinfection and location of each shower head in an electronic data base access to which is to be available to the University.

4 Six Monthly

Carry out monthly and quarterly routines as detailed in paragraphs 2 and 3 (above)

Take samples from every cold water supply tank feeding domestic hot water and domestic cold water services. Test samples for the presence of Total Viable Counts (TVCs)

Take samples from cold water sentinel points and test for the presence of TVCs.

Take samples from hot water sentinel points and from calorifiers and test for the presence of TVCs.

Record results from all Microbiological tests in an electronic data base access to which is to be available to the University.

Notify the Estate Support Service by email of any microbiological test which exceeds agreed set parameters and advise of any remedial action to be taken by the University and/or the service provider to rectify the problem.

Inspect and record in an electronic data base the condition of all cold water storage tanks feeding domestic hot water and cold water services.

Notify the Estate Support Service of any deviation from the recommendations within L8 concerning the condition of potable water storage tanks and any remedial action required.

Inspect and record in an electronic data base the condition of all domestic hot water calorifiers.

Notify the Estate Support Service of any deviation from the recommendations within L8 concerning the condition of domestic hot water heating systems and any remedial action required.

5 Annual

Carry out monthly, quarterly and six monthly routines as detailed in paragraphs 2, 3 and 4 (above)

Take samples from every cold water supply tank feeding domestic hot water and domestic cold water services. Test samples for the presence of Legionella.

Take samples from cold water sentinel points and test for the presence of Legionella.

Take samples from hot water sentinel points and from calorifiers and test for the presence of Legionella.

Record the results from all Legionella tests in an electronic data base access to which is to be available to the University.

Notify the Estate Support Service by email of any Legionella test which exceeds agreed set parameters and advise of any remedial action to be taken by the University and/or the service provider to rectify the problem.

Take samples from 1 drinking water outlet in each building, recording where and when, and carry out a drinking water quality analysis. A different outlet is to be tested each year.

Complete maintenance of risk assessments and present findings to an annual review meeting with the Estate Support Service.

Complete audit of the previous 12 months and present findings to an annual review meeting with the Estate Support Service.

6 Annual Audit

An independent water hygiene service provider will be employed to conduct annual audits of compliance with the University's policy, systems and procedures. Findings arising from the audit will be presented to the ESS Health and Safety Management Group and the Strategic Water Safety Group.

The audit report shall contain, but not be limited to an overview of performance, successes and failures in compliance with the 'Approved Code of Practice and Guidance L8' along with any necessary recommendations for amendments to systems and procedure to be adopted for the following year.

The audit report shall be in electronic format for record keeping purposes and a written précis of the salient points made available for further discussion and agreement.

7 Unit Annual health and safety reports will include a section aimed at measuring compliance with this policy.

8 Maintenance of Existing Risk Assessments and the Provision of New Risk Assessments

The Estate Support Service has copies of the Assessment of the Risk of Legionellosis for each building and the potable water services contained therein.

The Service Provider is to update these Assessments during the course of the contract and hand over the revised assessments at the annual audit meeting

The Service Provider is to include within his pricing structure for the carrying out, preparation of and presentation of these Assessments so that 33% of the existing assessments are renewed annually.

The Service Provider shall carry out new risk assessments to BS 8580 2010 Water Quality, Risk Assessments for Legionella Control, Code of Practice for hot and cold water systems for new buildings constructed during the period of the contract or for buildings or hot and cold water systems significantly modified during the course of the contract.

Risk Assessments shall be in electronic format for record keeping purposes and a written précis of the salient points made available for further discussion and agreement on any remedial work necessary to comply with the requirements of L8.

9 Record Keeping

Paragraphs 66 and 67 in ACOP L8 specifies which records are required, the information to be contained therein and the duration for which they should be retained.

The Service Provider is to develop an electronic data base for all records which have to be maintained. The format of the electronic database shall be submitted for approval by the University within 4 weeks of the contract being let.

Access to the contents of the database must be available to the University at all times.

The electronic database and any other records relating to this contract shall remain confidential between both parties. The Service Provider shall not reproduce any records or documentation associated with this contract to any other party without the express permission of the University.

All records, electronic or otherwise, necessary to be retained under the L8 recommendations shall become the property of the University as soon as the format is agreed and data is entered therein. All records will be retained for a period of 3 years

It shall be the responsibility of the Service Provider to ensure all records, electronic or otherwise, are kept up to date with data entered within 5 working days of the data being collected.

10 Sampling and Taking of Temperatures

The Service Provider is to carry out Water Sampling as per the procedures laid out in ‘The determination of Legionella bacteria in water and other environmental samples (2005) Part 1 – Rational of surveying and sampling’ published by the Environmental Agency and BS 7598 2008 ‘Sampling for Legionella Bacteria in water Systems’ published by the British Standards Association.

Analysis of all water samples for Legionella must be tested by a UKAS accredited laboratory which takes part in the PHLS Water Microbiology External Quality Assessment Scheme for the Isolation of Legionella from Water.

If a Service Provider has access to its own laboratory for sample testing of TVCs and Legionella this information must be included with the tender submission accompanied by copies of the appropriate accreditations.

Under no circumstance shall glass thermometers containing mercury be used for taking water temperatures.

Sentinel points are the nearest and farthest to and from the calorifier and/or water storage tank plus a random tap (which must be different at each visit, the location of which must be recorded) in each service approximately mid way between the nearest and farthest points.

11 Cleaning and Disinfection of Showers (Quarterly or as necessary)

- Dismantle shower head
- Clean off scale with stiff bristle brush
- Place all parts into a clean container with a solution of ‘Chloros’ solution to 50ppm, or other equal and approved
- Leave for a minimum of 10 minutes
- Remove from solution and rinse thoroughly in clean water
- Flush through valve and shower hose
- Reassemble shower head and put back into service
- Check shower temperature to ensure thermostatic valve (if fitted) is working correctly. Report as faulty if not
- Record details, eg date, room number, building etc in electronic data base

12 Bacteriological Action Procedures

Newcastle University have adopted the following Bacteriological Procedures from the Water Hygiene services provider (Hertel Solutions).

Parameter	Result	Action
Coliforms	0 cfu / 100 ml	No Action Required
	1-3 cfu / 100 ml	**First Level Action – Review and resample.** Re-sample previous outlet/tank and consider need to sample other outlets on the system including incoming mains. Ensure outlets sampled have been flushed thoroughly and externally disinfected. Evaluate results of other samples taken at same time and any history of poor temperature control, potential for stagnation and previous bacteriological results from system etc. Recommend additional corrective action where required. If re-samples clear then no further action required. **Second Level Action – Clean & disinfection.** If previous positive result persists then a Priority Corrective Action Form is issued to Client advising of the need to carry out a clean and disinfection of system concerned. Evaluate results of other samples taken at same time and any history of poor temperature control, potential for stagnation and previous bacteriological results from system etc Recommend additional corrective action where required. Further re-sampling should be carried out for confirmation. If result fails again repeat Second Level Action and escalate to Senior Manager
	Greater than 3 cfu / 100 ml	**Second Level Action – Clean & disinfection.** If previous positive result persists then a Priority Corrective Action Form is issued to Client advising of the need to carry out a clean and disinfection of system concerned. Further re-sampling should be carried out for confirmation.

E Coli	0 cfu / 100 ml	No Action Required
	1 or more cfu / 100 ml	**Second Level Action – Clean & disinfection.** If previous positive result persists then a Priority Corrective Action Form is issued to Client advising of the need to carry out a clean and disinfection of system concerned. Evaluate results of other samples taken at same time and any history of poor temperature control, potential for stagnation and previous bacteriological results from system etc Recommend additional corrective action where required. Further re-sampling should be carried out for confirmation. If result fails again repeat Second Level Action
TVC	Less than 1000 cfu / ml @ 22^0C or Less than 100 cfu / ml @ 37^0C	**No Action Required** - Considered to be Less than a 10-fold increase over EEC Guide Levels i.e. no significant abnormal change compared with typical incoming supply
	1000 – 9999 cfu / ml @ 22^0C or 100 – 999 cfu / ml @ 37^0C	**First Level Action – Review and resample.** Re-sample previous outlet/tank and consider need to sample other outlets on the system including incoming mains. Ensure outlets sampled have been flushed thoroughly and externally disinfected. Evaluate results of other samples taken at same time and any history of poor temperature control, potential for stagnation and previous bacteriological results from system etc. Recommend additional corrective action where required. If re-samples clear then no further action required

		Second Level Action – Clean & disinfection. If previous positive result persists then a Priority Corrective Action Form is issued to Client advising of the need to carry out a clean and disinfection of system concerned. Evaluate results of other samples taken at same time and any history of poor temperature control, potential for stagnation and previous bacteriological results from system etc Recommend additional corrective action where required. Further re-sampling should be carried out for confirmation. If result fails again repeat Second Level Action

The above recommendations have been made to provide clear practical guidance based on the following reference documents:-

1. The Water Supplies (Water Quality) Regulations 2000. SI 2000 No. 3184.
2. The Microbiology of Drinking Water (2002) - Methods for the Examination of Waters and Associated Materials - A report by the Environment Agency.
3. Legionnaires' Disease, The Control of Legionella Bacteria in Water Systems. The Approved Code of Practice and Guidance January 2001

13 Priority Corrective Action Procedure (PCAF)

In the event that the Water Hygiene Service Provider discovers a fault or a defect which requires remedial action to be taken or in the event that a sample analysis returns a result which is outside of normal parameters they will inform Estate Support Service Maintenance Officers by raising a "Priority Corrective Action Form" and emailing it to all Estate Support Service Maintenance Officers ensuring a response is generated.

On receipt of a PCAF Maintenance Officers will:

1. Place a copy of the PCAF document in Operations drive > Central Contracts > Legionella Contract Hertel > PCAF Initial.

2. Raise job on Backtraq fm to cover remedial works.

3. MOB/MOE raising job to annotate details in the 'actions taken' section of the PCAF, then forwards via e-mail to relevant Direct Works Supervisor for further action.

4. In the case where the ‘actions taken’ is to be carried out by the water hygience service provider, the ‘actions taken’ section is to be annotated with both a job number and a purchase order number and e-mailed back to the nominated contact at the Water Hygiene Company (danielle.bayliss@hertelsolutions.com.) A copy of this is to be report is to be kept in ESS Maintenance Files (Ops drive > Central Contracts > Legionella Contract Hertel > PCAF Remedial Actions)

5. When Direct Works have completed their remedial work, the Supervisor is to complete the job on Backtraq fm and annotate the ‘actions taken’ section of the PCAF detailing actions taken and date. A copy of this completed PCAF is then to be e-mailed to danielle.bayliss@hertelsolutions.com and the MOB/MOE raising the work.

6. MOB/MOE on receipt of the above is to place a copy of the completed PCAF in Ops drive > Central Contracts > Legionella Contract Hertel > PCAF Remedial Actions.

14 Monitoring and Maintenance Program (Newcastle University Staff)

14.1 Whilst the Estate Support Service are responsible for water systems as a whole it is not possible for ESS maintenance staff to identify outlets that are used infrequently, nor can they be responsible for any equipment connected to outlets unless it is for the sole use of ESS staff.

As set out below, the University will maintain a program of flushing little used outlets in accordance with ACOP L8 in order to reduce the risk of Legionella bacteria proliferating in systems.

14.2 Residences

Housing Managers will identify infrequently used outlets, including toilets, and will implement a program of flushing each outlet on a weekly basis (2 minutes taps, 2 x flushes toilets). The flushing regime will be recorded in a site log book (see Appendix 3).

14.3 Communal Washroom and Toilet Facilities

Building Facilities staff will identify through assessment infrequently used outlets, including toilets, and will implement a program of flushing each outlet on a weekly basis (2 minutes taps, 2 x flushes WC’s). The flushing regime will be recorded in a site log book (see Appendix 3).

14.4 Laboratory, Workshop, Preparation Rooms and Kitchen Facilities in Schools

Heads of Schools will identify outlets which are infrequently used and will implement a program of flushing each outlet on a weekly basis for 2 minutes each time.

The flushing regime will be recorded on a site log (Appendix 3) which will be kept in the school, particular attention should be given to eyewash and drench shower facilities and flushing must be carried out in a controlled manner to minimise the production of aerosols.

14.5 Catering Outlets

Catering Managers will identify outlets, including toilets, which are infrequently used (eg holiday/shutdown) periods and will implement a program of flushing each outlet on a weekly basis for 2 minutes each time, the flushing regime will be recorded on a site log book. It is important that the flushing is carried out in a controlled manner to minimise the production of aerosols.

14.6 Third Party Occupied Space

It will be written into lease arrangements that 3rd party occupiers will identify outlets in the space they occupy, which are infrequently used and will implement a program of flushing each outlet on a weekly basis for 2 minutes each time. The flushing regime will be recorded on a site log which will be kept by the occupier, particular attention should be given to eyewash and drench shower facilities and flushing must be carried out in a controlled manner to minimise the production of aerosols.

14.7 Clinical Areas

Clinical Areas where patients may visit are subject to the Newcastle upon Tyne NHS Foundation Trust, “Management and Control of Legionellosis including Legionnaires Disease Policy” and the procedures for flushing infrequently used outlets will be carried out in accordance with this policy.

Appendix 7

Newcastle University, Strategic Water Safety Group, Terms of Reference

1 Purpose

The purpose of the Strategic Water Safety Group is to agree the University's Policy for the Control of Legionella in Water Systems and to oversee its implementation and application.

The group will meet twice yearly.

2 Membership

Name	Role
Brian McBride (Chair)	Assistant Director of HR (Health and Safety)
Carol Camsell	SAgE Safety Officer
Clare Rogers	Director of ESS
Steve Lynn	Head of Maintenance
Gary Morton	ESS Health & Safety Officer
Tom Anderson	Chair-SAgE Safety Committee
Steve Homans	Incoming Chair-SAgE Safety Committee
Steve Smith	SAgE Faculty Coordinator
Barry Argent	Chair-FMS Safety Committee
Christina Murison	FMS Faculty Coordinator
Neveen Hamza	Chair-HASS Safety Committee
Carol Young	HASS Faculty Coordinator
Paul Bandeen	Manager AHS
Ruth Draper	Chair PSS Safety Committee

3. Objectives

1. To oversee the implementation and application of the University's policy for the Control of Legionella Bacteria in Water Systems

2. To monitor application of the policy and address areas on none compliance with appropriate University Managers

3. To review and revise (as necessary) the policy for the Control of Legionella Bacteria in Water systems at two yearly intervals

4. To receive annual audit reports on compliance with the policy and legislation and to present an annual report to the University Safety Committee