

# WATER SAFETY POLICY

Water Safety Policy

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Health and Safety Policy			
The Control of Substances Hazardous to Health (COSHH)			

**Amendment History**

Issue	Status	Date	Reason for Change	Authorised

**Please note:**

**If you require a copy of this policy in an alternative format (for example Large Print, Easy Read) or would like any assistance in relation to the content of this policy, please contact the Human Resources (HR) team on 01803 656680.**

## 1.0 POLICY STATEMENT

The Trusts accept their responsibility under the Health and Safety at Work Act 1974 and the Control of Substances Hazardous to Health Regulation 2002 as amended, to take all reasonable precautions to prevent or control the harmful effects of contaminated water (i.e. Legionella) to staff, patients, residents, visitors and any other persons working at, or using its premises.

The Policy uses the Health Technical Memorandum HTM 04-01 and the Health & Safety Commissions (HSC) L8 Approved Code of Practice & Guidance as reference for compliance with legislation and best practice guidance to maintain Standards for Better Health standard C20a to promote effective care and optimise health outcomes by being a safe and secure environment.

The aim of this policy is to ensure adequate and effective control of water systems throughout the Trusts' premises in order to maintain safe water systems.

A temperature control, effective outlet usage and copper-silver ionization are the preferred strategies for reducing the risk from legionella and water borne organisms in water systems.

The Estates and Facilities Directorate, through the Responsible Person [Water], will play the lead role.

The Director of Infection Prevention and Control, and other members of the Infection Control Team, will act as specialist advisors.

All Trust managers will ensure that staff in their areas use water systems appropriately; in particular, addressing infrequently used outlets.

## 2.0 ROLES & RESPONSIBILITIES

### 2.1 The Chief Executive Officers (CEO's)

The CEO's of the Trusts are the duty holders and have overall accountability for all aspects of the quality of water supplies.

All relevant persons shall fully appreciate the actual and potential risks of legionellae and the concept of risk management. Although compliance with the guidance may be delegated to staff, or undertaken by contract, accountability cannot be delegated.

### 2.2 Director of Estates & Commercial Development

This Individuals Role:

- Delegated duties from the CEO's for providing safe water systems within the Trusts
- Ensures adequate resources and support are available within the Trusts for the implementation of this policy
- Maintains management responsibility for the Responsible Person [Water]

## 2.3 Responsible Persons [Water]

The Responsible Person [Water] is the Head of Estates.

The Responsible Person [Water] will be required to liaise closely with other professionals in various disciplines.

This individual's role involves:

- Advising on the potential areas of risk and identifying where systems do not comply, producing a monthly compliance and exception report to Workstream 5 (see Appendix 4 for reporting format)
- Liaising with the water undertaker (Water Supply Company) South West Water (SWW) and the Water Regulations Advisory Scheme (WRAS), to ensure that equipment that is permanently connected to the water supply is properly installed in accordance with Water Supply (Water Fittings) Regulations 1999
- Advising on the necessary continuing procedures and actions for the prevention or control of legionellae and maintain up to date knowledge in respect of impending and current legislation and best practice. Disseminate this to all those involved in the prevention and control of water borne infections and maintenance of water quality
- In conjunction with the Trust Project Manager (Estates or Capital) any completed installation, following testing and commissioning is inspected and 'signed off' as acceptable
- Ensuring that risk assessments are carried out, the risks identified and a written action plan, ratified by the Water Safety Quality Group (WSQG) is devised based on the results
- Monitoring the implementation and efficacy of these procedures and actions
- Approving and identifying any changes to those procedures and / or actions
- Establish and maintain adequate reporting systems concerning the prevention and control of water borne infections and maintenance of water quality
- Maintaining and co-ordinating adequate records in compliance with current legislation and best practice
- Co-ordinating with specialist competent help
- Liaising with Director of Infection Prevention Control (DIPC) to carry out the necessary actions should an outbreak of legionnaires' disease be suspected or high levels of Legionella bacterium are detected
- Formulation of water safety reports to WS5, H&S Committee and Infection Prevention Control Committee
- To ensure adequate safe water training is made available to estates staff

- The Responsible Person [Water] will have a named deputy who will act in his absence. For an absence of more than a month, a new Responsible Person [Water] will be nominated

## **2.4 Control of Infection**

The Director of Infection Prevention Control (DIPC) provides specialist advice in relation to safe water systems and Microbiological expertise on the control of water borne infection.

The DIPC will head the Outbreak Control Team, as determined in Appendix 1 of the “Operational Management” volume of HTM 04 - 01 and this policy.

The function of the DIPC is to:

- Advise on the continuing procedure for the prevention and/or control of water borne organisms
- Carry out the necessary action if an outbreak of disease is suspected
- Advise on the location of “high risk” patient services
- Support and feedback to the WSQG
- If urgent infection control advice is required the consultant microbiologist on- call will deputise for the DIPC in their absence

## **2.5 Deputy Responsible Person [Water]**

The Deputy Responsible Person [Water] will be the Operational Lead Mechanical Supervisor. This person will act as deputy in the absence of the Responsible Person [Water] and support the WSQG

## **2.6 Estates Operational Engineers, Building Managers and Competent persons**

These professionals shall ensure that they follow the guidance laid down in this document and the relevant primary reference publications upon which this is based (HTM 04 – 01 & HSC ACOP L8). They shall also ensure that they are up to date, by attending relevant awareness and training sessions. In particular, these professionals shall report any defects, suspicions or concerns regarding the design, condition, operation or performance of water systems that might increase the risk of Legionella/pseudomonas proliferation. Records of all actions taken with respect to Legionella control shall be generated and maintained.

The Estates Department provides water safety risk management training to its staff, appropriate to the responsibilities of each staff member. For example technical and procedural training is provided to trades staff. The Responsible Person [Water] is provided with training specific to his legionellosis risk management role and responsibilities.

Craftsmen shall employ their highest standards of workmanship; use only new materials

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approved by the latest edition of The Water Supply (Water Fittings) Regulations 1999 (WSR) when working on water systems; report any defects, suspicions or concerns regarding the design, condition, operation or performance of water systems that might increase the risk of Legionella proliferation.

## 2.7 Specialist Legionella Contractors

Contracts between the Trust and specialist service providers should clearly define the responsibilities of both parties. BSRIA's (1992) Application Guide AG 4/89.2 'Maintenance contracts for building engineering services' provides advice on aspects to be considered when obtaining contract maintenance.

In relation to the control of *Legionella*, it is essential to ensure that the potential contractors have suitable qualifications for example companies/individuals who are members of the Legionella Control Association.

## 2.8 Design Professionals and Managers

The design of new and refurbished water systems shall follow the guidance in HTM 04-01 Part A and any specific requirements contained within this document.

The person commissioning external designers is responsible for ensuring the design requirements of this document are met.

## 2.9 Managers of Individual Areas

Managers shall fully appreciate the actual and potential risks of *legionellae* and the concept of risk management.

Managers have control of, and responsibility for the use of water in their areas.

Likewise these managers hold the legal consequences of the operational aspects of legionella control within their specific area of responsibility.

In order to fulfill their legal obligations, managers are required to:

- Comply with the Water Safety Policy statement and follow the guidance contained within the *Legionella* procedures manual
- Ensure that all water outlets are used at least daily, particularly where high risk patient groups are involved
- Identify poorly used outlets i.e. outlets not used every day for at least 2 minutes, and remedy this by flushing for at least 3 minutes each day, or have them permanently remove
- Manage any agreed water outlet flushing programme
- Report any defects, suspicions or concerns regarding the design, condition, operation or performance of water systems that might increase the risk of *legionella* proliferation

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- Keep relevant records, e.g. estates work log books and water outlet flushing actions
- Attend *Legionella* awareness/ training sessions
- Take part in discussions regarding *Legionella* risk for any new designs/installations
- Take part in *Legionella* risk review for their area
- If there is a change of use/occupation time/change in type of patient (immunosuppressant), it is the responsibility of the Manager to inform the Responsible Person [Water] of the details in writing with at least 14 day notice
- Where part or all of a building is going to close for a period of greater than one week, it is the responsibility of the Manager to inform the Responsible Person [Water] of the details in writing with at least 14 day notice
- Where part or all of a building is going to reopen following a period of closure, it is the responsibility of the Manager to inform the Responsible Person [Water] of the details in writing with at least 14 day notice

## 2.10 Contractors – Operational and Capital Works

Contracts with third parties will clearly define the responsibilities of both parties.

The roles and responsibilities of contractors involved in the control regime shall be defined in writing, in contract documents.

Any agreed deviation from the initial contract documents shall be mutually agreed and documented as part of the contract review process.

Contractors will be chosen prior to the proposed contract with regard to suitability. The competence of such contractors will be assessed. The minimum requirement for new contractors shall be registration the Approved Plumbers Scheme.

The contractor will provide evidence where applicable of historic dates of previous contracts with regard to water services.

The contractor will provide where applicable, risk assessments and method statements for project related tasks.

## 2.11 All other Staff

All staff members can affect legionellosis risk, they have a responsibility to maintain a safe working environment and as such will conduct their tasks in accordance with this guidance;

Must report any defects, suspicions or concerns regarding the design, condition, operation or performance of water systems that might increase the risk of *Legionella* proliferation to the Responsible Person [Water] and keep relevant records; i.e. flushing.

## 2.12 Lease holders/third party Responsibilities

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Where the Trust leases its property to third parties, the lessee and their staff can, by their actions affect legionellosis risk, they have a responsibility to maintaining a safe working environment and as such will conduct their tasks in accordance with this guidance;

Report any defects, suspicions or concerns regarding the design, condition, operation or performance of water systems that might increase the risk of Legionella proliferation and keep relevant records; i.e. flushing.

### 3. PROCEDURES

These procedures apply to all properties currently owned or leased by the Trusts

#### 3.1 Protection of Maintenance Personnel - Contaminated Aerosols

The disinfection procedures presented for cold water storage tanks, domestic hot water vessels and water systems with a significant risk of high level **contamination of legionella** involved, are designed to minimise the risk to staff and others that may come into contact with water **In all instances of draining, water should be drained in such a way as to avoid the creation of an aerosol.**

Personnel using PPE must be adequately trained to do so and equipment must be properly maintained.

#### 3.2 Other Health and Safety Issues

If plant is located in confined spaces, reference on entry into confined spaces can be sought from Safe Work in Confined Spaces Approved Code of Practice, Regulations and Guidance.

Because water treatment chemicals, including chlorine-containing chemicals and solutions, are often toxic or corrosive they should be used cautiously to ensure that they do not endanger the users or other occupants of the building. Water treatment should be carried out by, or under the direction of, people who are suitably qualified and experienced.

The use of water treatment chemicals should be subject to a COSHH assessment and permission would be required from the Water Authority (SWW) prior to any discharge to sewers, storm water drains and watercourses. The Environment Agency should be contacted prior to direct discharge to water courses.

#### 3.3 Risk Management Audit

An annual legionellosis risk management audit is undertaken in order to ascertain the effectiveness of the broad management arrangements. The methodology for audit may vary from year-to-year in order to ensure a fresh outlook on each occasion. The audit report includes recommendations for improvement which should be addressed or added to the annual plan.

#### 3.4 Statutory Risk Assessments

A suitable and sufficient Legionella risk assessment will be carried out on all buildings currently owned/leased or occupied by the Trusts in accordance with current legislation and best practice guidance [HTM 04-01 Part B para 2.3].



The objective of the risk assessment is to institute management procedures to ensure that compliance is continuing and not notional.

Risk assessments will be reviewed at least every two years, or whenever there is reason to believe that the original assessment may no longer be valid. This may be because of:

- Changes to the plant or water or its use
- Changes to the use of the building in which it is installed
- The availability of new information about risks or control measures
- The results of checks indicating that the control measures are no longer effective

This will form the basis of an action plan to address any outstanding precautionary measures.

The risk assessment and action plan will be reviewed by the WSQG in preparation of the Annual Plan.

Risks will be assessed not just for the routine operation of the system, but also in unusual circumstances such as; breakdown, abnormal operation, design, installation and commissioning. Action plans, and work procedures developed and implemented to reduce the risk to a minimum.

The assessments, written schemes and implementation of precautionary measures, will be carried out by someone with the necessary competence and resources to complete the tasks proficiently and safely. If the expertise required is not available within the Trusts, it may be necessary to appoint one or more experts from outside the Trusts with clear, written responsibilities and lines of communication.

A written action plan, devised by the Responsible Person [Water] based on the results of the Risk Assessments will clearly identify who has overall accountability for the premises, and who is responsible for devising and carrying out the procedures.

Inadequate management, lack of training and poor communication have all been identified as contributory factors in outbreaks of Legionnaires' disease. It is therefore important that those people involved in assessing risk and applying precautions are competent, trained and aware of their responsibilities.

### **3.5 Design, construction, commissioning and handover**

In order to avoid potentially costly remedial works, the design of new buildings and their water systems together with adaptations or upgrades are to be controlled in order to **“get it right first time”**.

All project work engineering designs are to be vetted at sketch scheme stage prior to the project proceeding to full design. All significant changes pre or post tender are to be refereed back to Responsible Person [Water].

Discussions regarding *Legionella* risk must be made with the users.

The completed installation, following testing and commissioning is to be inspected and 'signed off' as acceptable by the Project Manager (Estates or Capital) in charge of the project.

The checklist provided in the Appendix 2 should be used by Capital Projects and Estates staff and supplied to design consultants in order that they may check their own designs. This checklist is not a design brief and is not intended to deal with all potential design issues, but as a management check. If these issues are incorrect it is likely that other aspects of the design are also not compliant with good or best practice.

The design and installation of the cold and hot water services, and associated plant and equipment, in new, upgraded or refurbished premises will comply with;

- The Water Supply [Water Fittings] Regulations 1999
- BS6700:2006 British Standard Specification for design, installation, testing and maintenance of services supplying water for domestic use within buildings
- HSE Approved Code of Practice and Guidance Document [L8] – “Legionnaires’ disease: the control of Legionella bacteria in water systems”
- HTM04-01: Water Systems – The control of Legionella, Hygiene, “Safe” Hot Water, Cold Water and Drinking Water Systems. Part A: Design, Installation and Testing
- HTM04-01: Water Systems – The control of Legionella, Hygiene, “Safe” Hot Water, Cold Water and Drinking Water Systems. Part B: Operational Management
- HTM 64 Sanitary Assemblies 2006
- HTM 03 – 01 Specialist Ventilation for Healthcare Properties Part A & B
- DO8 Specification for Thermostatic Mixing Valves
- Health Guidance Note – Safe Hot Water and Surface temperatures

Copies of the documents are held by The Estates Department and the Capital Projects Department.

When new designs are produced, consideration is made of the impact of new technologies/ techniques and their impact on water consumption, eg the use of alcohol hand-rubs significantly reducing the use of hand basin water supplies.

### **3.6 Maintaining Control of Systems During Construction and Testing**

During the period of construction and testing the system will be made safe by appropriate methods used for the protection of the water system from ingress of foreign bodies likely to cause contamination. Similarly the materials used in the installation are to be protected from contamination during the works i.e. use of correct jointing materials, seal ends of pipes and packing of pipework components.

Post charging with water the system will be made safe by biocide or flushing.

Estates Operational Managers and Capital Project Managers will ensure that either regular maintenance work, Minor upgrade works or Capital installation of hot and cold water services, carried out either by Direct labour or contractors, will be tested and commissioned in accordance with HTM 04 - 01.

## **4. MAINTENANCE AND OPERATION OF WATER SYSTEMS**

### **4.1 Occupation of New Premises - Procedure Until Occupation**

This procedure is designed to prevent the risk of legionellosis developing in a new building / department through the interim period following construction, commissioning and hand over to occupancy.

Design and Build Contracts - outbreaks of legionnaires' disease have been associated with 'design and build' type contracts, under which the client retains no clerk of works on site and where there is no 'commissioning' period on completion of the work. It is vital that immediately before occupation that cleaning and disinfection is undertaken.

Once the system is in use and has been cleaned and chlorinated prior handover from the contractor, the named the Project Manager (Estates or Capital) of the project, shall be responsible for the monitoring and observation of the system, and ensure that the system is operated in accordance with the Trusts 'Procedure for Temporary Closure'.

At the point of hand over to the Trust from the contractor the Project Manager (Estates or Capital) must submit all relevant information on system performance together with as-fitted drawings and design criteria of the domestic hot water systems and cold water services to the Responsible Person [Water] who will assume responsibility for the premises.

Occupancy of the new property should be as soon after hand over as possible to prevent further costs being incurred due to the need for re-chlorination of the water systems. From handover until the time at which the building is fully occupied, flushing of any unused or little used outlets will be undertaken on a weekly basis (see appendix 3 for flushing guidance).

### **4.2 Residential accommodation**

This section applies to domestic properties served by individual water systems. Where domestic properties share a common water system, the procedures for the larger premises apply.

The Trust recognises its obligations as a provider of residential accommodation. In practical terms it fulfills these by routine maintenance checks/actions immediately prior to the occupation of a domestic dwelling by a new tenant and by provision of information to the new tenant.

Whenever the expected time delay between vacation of accommodation by one tenant and occupation by the next is greater than one week, the accommodation unit is to be visited by a member of the accommodation staff within one week prior to occupation

and the following actions taken, in the order stated:

- The hot water system is switched on
- All WCs are flushed twice [on full flush where dual flush type]
- Each hot and each cold water outlet is run for three minutes, creating as little aerosol as possible
- The shower head is removed and the shower hose run underwater for three minute;
- The hot water system is left switched
- Any defects are reported to the Estates Helpdesk and wherever possible, rectified prior to tenant occupation

These actions apply to accommodation served by either a conventional hot water system or a combination boiler.

The Trust can influence but not control the actions of its domestic tenants. It exerts its influence by the provision of the following guidance as part of the general information provided to new tenants.

#### **4.3 Procedure in the Event of Closure / Change of use**

Where part or all of a building is going to close for a period of greater than one week, or that there will be a change of use/occupation time/change in type of patient (immunosuppressant), it is the responsibility of the Manager to inform the Responsible Person [Water] of the details in writing.

Following a closure decision, negotiations between the relevant manager and the Responsible Person [Water] must take place to ensure that the following procedures are established and documented, and to clearly define what actions named individuals shall perform. A written notice (not email) of at least 14 days is to be made to the Responsible Persons [Water] regarding any proposed closure.

The period of closure should be established at the earliest point in negotiations. The period for which an area is closed can play an important part on the cost implication and involvement of a closure.

#### **4.4 Temporary Closure**

Where a closure is expected to not exceed 60 days a weekly PPM will be implemented by Estates maintenance to run every tap for 3 minutes and flush every toilet twice weekly. The nominated individual should then complete the record sheet, signed by themselves and their relevant manager, the completed form being forwarded to the Responsible Person [Water].

It is the responsibility of the relevant manager to notify the Estates Department in writing

giving notice as appropriate in advance of their intention to re-open a temporarily closed area

Before the closed area is re-occupied the Estates Department may carry out an inspection and test of the water systems and report its condition to the Responsible Person [Water] for any remedial works that may be required.

#### **4.5 Indefinite Closure**

In the instance that part or all of a building is to close with no planned re-opening date, or where the closure period exceeds 60 days, negotiations must be held as detailed above, and funding made available to the Estates Department by the manager of the department that is closing, in order to disconnect and drain the water services within the affected area. The relevant manager should be aware that considerable cost for modifications could be needed to achieve this requirement in some large properties.

Where relevant - all water tanks associated with the affected area shall be drained, cleaned and dried out.

All pipework and devices shall be drained and where applicable domestic hot water calorifiers [or other storage vessels] shall be opened up, cleaned and left open to the atmosphere.

Pipework shall be disconnected from the mains services and capped off, mains cold water services shall be isolated and capped off from the system and all relevant pipework drained.

Notices shall be posted throughout the affected area stating that all water services are disconnected.

The Estates Department shall be responsible to ensure that an adequate water seal exists in unused toilets to prevent odours from the foul drain system entering the premises.

Adequate records of actions, and amended water service schematic diagrams shall be produced by the Estates Department showing the relevant modifications and disconnections made to the water systems.

#### **4.6 Re-occupation of an Indefinitely Closed Area**

In the event of re-occupation of an indefinitely closed area, full negotiations must take place between the relevant manager and the Estates Department prior to the re-occupation exercise.

Following a decision to re-open, negotiations between the relevant manager and the Responsible Person [Water] must take place to ensure that the following procedure is established and documented, and to clearly define what actions named individuals shall perform. A written notice (not email) of at least 14 days is to be made to the Responsible Persons [Water]

The Responsible Persons [Water] will require the following information:

- The planned re-opening date

- Any proposed changes of use of the area
- Any areas which will not be used

The Responsible Persons [Water] will provide the relevant manager with a cost to put the water systems [for which the relevant manager must provide funding] back in service.

Before the water system is put back into service, any necessary modifications and maintenance shall be carried out prior to the cleaning of the system.

#### **4.7 Emergency and Outbreak Actions**

The contact details, both during office hours and out-of-hours, of the Responsible Person [Water] & deputy and the DIPC are kept on the main switchboard and the major incident control room.

An outbreak is defined by the Health Protection Agency [HPA] as 2 or more confirmed cases of legionellosis occurring in the same locality within a six month period.

The Trust will follow the guidance presented in Appendix 1 of the “Operational Management” volume of HTM 04 - 01.

The Responsible Person [Water] and the Health & Safety Lead will be informed of a suspected outbreak of legionnaires’ disease by the DIPC. An investigation will be carried out in association with the Health Protection Agency and the local Consultant in Communicable Disease Control.

An incident group composed of local experts and building users would be convened by the Trust in the event of an outbreak of legionnaires disease.

It is essential that systems are not drained or disinfected before samples have been taken.

The investigation will concentrate upon all potential sources of Legionella contamination, including:

- Domestic hot and cold water storage and distribution systems
- Showers or spray washing equipment
- Drainage systems and traps
- Whirlpool baths or hydrotherapy pools
- Condensate trays and traps from air conditioning cooling coils
- Humidification equipment
- Ice-making machines and water coolers

The Responsible Person [Water] will be required to:



- Provide details of all pipe layouts and associated equipment
- Provide adequate documentation detailing operation and maintenance procedures
- Assist the investigation team by locating outlets from which samples can be taken. Easy access to these sampling points is essential
- Identify water supplies to medical equipment such as orthodontics, renal dialysis, respiratory therapy
- Provide any off-site information e.g. local excavation or earthmoving works, alterations to water supply or drainage systems

If any relevant legislation has been infringed then SDHCFT may be subject to a formal investigation by the Police and/or Health and Safety Executive.

Once the samples have been taken and the cause of infection identified, it is the responsibility of the Responsible Person [Water] to carry out disinfection procedures and effect any remedial action.

#### **4.8 Guidelines for Investigating Single Hospital Cases of Legionnaires' Disease**

It will be the responsibility of the hospital's DIPC to lead the investigation into a single case in a hospital, it is essential that the local Consultant in Communicable Disease Control (CCDC) is informed as soon as possible. The DIPC will be responsible for updating this procedure.

An incident group composed of local experts and building users would be convened by the Trust in the event of an outbreak of legionnaires disease.

Clinical diagnosis of legionnaires' disease must be supported by confirmed or presumptive microbiological evidence.

As soon as a laboratory diagnosis has been made by a microbiologist the case should be reported to the local CCDC and local infectious diseases clerk.

Investigations for Legionella infections may take place outside the residential area of the patient. If this is the case the suspected / confirmed diagnosis result should be immediately sent to the public health department in whose area the patient resides, the local CCDC can commence follow up procedures.

The CCDC to obtain the patient's movements for the two weeks prior to the onset of illness. This will include full address and postcode of place residences, place of work, travel details, accommodation details [overnight stays].

This should include details of possible hospitals visited and other potential common sites and exposure to Legionella.

Investigations specific to hospitals will require reviewing the risk assessment for controlling Legionella and maintenance records by the incident control team in conjunction with the Responsible Person [Water].

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The review of the risk assessment & maintenance records should identify if there are any deficiencies in controls as detailed by the HSE and NHS guidance. If any such deficiencies in the control are found these should be remedied as soon as possible. Any precautionary disinfection of any part of the water system should only be completed after sampling. This sampling will be under the direction of the incident control team and carried out in accordance with BS7592. (Method of Sampling for Legionella)

A case search for other confirmed or presumptive cases of legionnaires' disease associated with the hospital or community should be conducted.



#### 4.9 Operation of Water Systems – Estates Procedures

Water systems will be operated in accordance with the following schedule;

System/ Service	Task	Frequency
Domestic cold water pressurisation pumps	Switch over pumps automatically,  Or, manually.	Daily  Weekly
Domestic cold water tanks	Where multiple tanks, operate in parallel.  Where one or more tanks are drained, ensure that all interconnecting pipework and mains cold feed are drained and vented.  Visually inspect and carry out remedial work where necessary.	Start up and at changeover.  Annually
Domestic hot water calorifiers	Where multiple, operate in parallel.  Where one or more calorifiers are drained, ensure that all interconnecting pipework and cold feed are drained and vented.  Thermostat set to achieve minimum flow temperature of 60°C and a return temperature of at least 50°C.  In premises with high vulnerability occupants, calorifier to operate 24 hrs per day, 7 days per week. In other premises operate by time clock, to achieve full temperature one hour before occupation and one hour after each day.  Changeover multiple calorifiers Quarterly as per HTM 04-01 para 7.74 (this may be extended if little sludge accumulation)	Start up and at changeover.  Start-up  Start-up  Quarterly
DHW calorifier shunt pumps, where fitted.	Control by time clock.  Alternatively, if data plot for one week shows that calorifier performance criteria are met under continuous pump operation.	One hr per night  Continuously
DHW distribution pumps	In premises with high vulnerability occupants, distribution pumps to operate 24 hrs per day, 7 days per week. In other premises operate by time clock, to achieve full temperature one hour before occupation and one hour after each day. Where multiple pumps, switch over automatically.  Or, manually.  Manually check that the distribution pump[s] are operating effectively [by temperature checks].	Start-up  Daily Weekly  Monthly
Air conditioning plant humidifier	Set the fan to operate for 30 minutes before the humidifier starts up.  Set the humidistat to a maximum of 70% relative humidity.	Start-up  Start-up

#### 4.10 Flexible Hose connections

Evidence from scientific investigations of the occurrence of the legionella bacterium in hospitals has shown that some flexible hoses used in plumbing systems were heavily infected with biofilm which included the legionella bacteria.

Trust guidance to designers and installers is that braided flexible rubber/plastic hose connections must not be used on any new installations, with the exception of shower hoses.

Flexible hoses may be used for showers but they, and the shower head should be subject to a quarterly cleaning routine.

Existing flexible hoses to taps should be replaced wherever possible by rigid or soft copper tails, where this is not possible the aim is to replace the flexible hoses on a rolling program via the annual action plan.

#### 4.11 Cold Water Cisterns and Cold Feed Tanks

All new domestic cold water storage cisterns and tanks shall comply with the requirements of the Water Supply [Water Fittings] Regulations 1999 for cold water storage [heating system header tanks - F&E are excluded]. The actions necessary to bring existing tanks to the standards required by the Water Supply [Water Fittings] Regulations 1999, and timescales appropriate are tabled in the legionellosis risk minimisation scheme, and are to be reviewed as part of legionellosis risk re-assessment.

All cold water storage tanks with a water storage capacity of greater than 1000 litres containing potable water are to be examined and the temperature tested on a regular six monthly cycle and cleaned on an annual basis as required.

All other domestic cold water storage tanks are to be examined on an annual basis [where possible to coincide with the annual legionellosis risk re- assessment exercise], and cleaned and disinfected as detailed in the Tank Cleaning Procedure as required. When a tank is inspected, the presence of a label stating its contents and capacity is verified. If it is lacking, a new label is fitted.

#### 4.12 Connections to Outside Services

The existence of these connections and their necessity is checked on an annual basis.

#### 4.13 Pressurisation / Supply Pumps

Where two or more pumps have been fitted for pressurisation systems, the lead pump shall be changed over at least weekly in order to avoid water stagnation.

Dates and times of the manual pump change-over shall be recorded in the plant room log book. Print-outs of regimes for automatic systems will be adequate.

Where pumps have not been in service for a period of four weeks or greater, or have been removed for any reason, the pump and associated pipework shall be thoroughly washed out and disinfected before being brought back into service. Disinfection of pumps shall be to 50ppm free residual chlorine for 1 hour and pumps shall be totally submerged during this period. Incident report record sheet shall be completed giving details of why the pump

was out of use. Details of any such action shall be recorded.

#### **4.14 Domestic Hot Water Systems**

Calorifiers and Hot Water Cylinders are all a means of producing domestic hot water and are subject to the procedures below. Hereafter the term "Calorifier[s]" is used to describe any of the above mentioned domestic hot water storage vessels.

#### **4.15 Hot Water Storage and Distribution Temperatures**

The storage of domestic hot water should be arranged to ensure that a water outflow temperature of at least 60°C is achieved. It is important to maintain temperatures at above this figure [Legionellae organisms will survive for only a short period of time above this temperature - approximately two [2] minutes].

Permanent continuous monitoring of water temperatures via a building management system or data logger is recommended for higher risk premises in order to demonstrate performance.

The outflow water temperature, under prolonged maximum continuous demand [at least 20 minutes] from calorifiers should not be less than 60°C.

While it is accepted that occasionally under peak instantaneous or prolonged demand that the water outflow temperature will fall, it is not acceptable if this occurs frequently [more than twice in any 24 hour period] and / or for long periods [exceeding 20 minutes].

Under no circumstances, shall the domestic hot water flow temperature fall below 50°C.

It is recommended that disinfection by pasteurisation is undertaken if the water temperature of the calorifier falls below 45°C. Whenever the calorifier flow temperature falls below 45, for any reason, the Responsible Person [Water] will inform the DIPC in writing.

The temperatures should be maintained 24 hours a day, seven days per week

The guidance given in HTM 04-01 gives maximum set hot water temperatures for a range of applications i.e. baths, hand basins / showers etc).

A minimum domestic hot water circulation temperature of 55C at outlets [and inlets to TMVs] shall be maintained.

Thermostatic mixing valves (TMV) to D08 Type 3 shall be used to control hot water temperatures in all clinical and public areas and in areas not secured against public or patient access.

Thermostatic mixing valves (type 1 or 2) should be used in all other areas to control temperature.

All outlets which are not controlled are clearly labelled with fixed notices indicating 'very hot water'.

#### **4.16 Calorifier Operation**

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Calorifiers in high risk premises such as healthcare are to be run 24 hours per day, 7 days per week, and the domestic hot water circulation pump kept running. Should it be necessary for interrupted operation or shut-down over night, then the calorifier should be allowed to maintain its water storage temperature and the domestic hot water pump should be started up to ensure full temperature throughout the distribution system for at least one hour prior to occupation of the premises.

#### 4.17 DHW Circulation Pumps

Domestic hot water circulation pumps should perform in such a way to ensure a minimum water circulation temperature of 55C.

Only one domestic hot water distribution pump should be installed near the calorifier, and a spare pump kept for immediate replacement in the event of pump failure

In circumstances where it is impracticable to remove pumps, the pumps shall be switched daily to ensure that all pumps are regularly brought into service, thus avoiding stagnation. It may be more efficient to utilise an auto- changeover system.

It is not permissible to shut down the pumped circulation system. To do so will result in a loss of the required distribution temperatures.

#### 4.18 Air Conditioning Plant

At the time of preparation of this document, the Trust has air handling units that have wetted surfaces, i.e. chilling and heat recovery. Air handling units are maintained in accordance with the planned preventative maintenance (PPM) system and the actions recorded.

Glass borosilicate condensate traps, fitted to air handling units and ice- making machines are checked monthly as a PPM item to ensure that the water level is correct.

Portable Cooling air conditioning units should not be brought into Trust properties without reference to the Trust protocol on comfort cooling and an appropriate risk assessment carried out with the Responsible Person [Water].

Similarly split air conditioning systems shall only be installed in accordance with the trusts protocol on comfort cooling, and where approved installed and maintained by a competent company.

#### 4.19 Hydrotherapy Pools, Whirlpool Baths and Whirlpool Spas

Hydrotherapy pools, whirlpool baths and whirlpool spas provide conditions which may favour the growth of Legionella.

Whirlpool baths employ a single fill for each user, and do not present the same level of risk as spas, provided that the guidance recommended for hot and cold water systems is followed.

The hydrotherapy pool is maintained by Estates Maintenance staff, in accordance with the PPM system. The water is sampled weekly by the Estates Maintenance staff and sent for analysis via the Trust Microbiology Lab for TVC's (total viable counts), results are returned to

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Microbiology/Infection Control.

#### **4.20 Other Risk Systems**

Monitoring requirements for other risk systems should be based on the attached table in Appendix 1, based on similar tables in HTM 04 - 01 and the HSE ACoP L8

#### **4.21 Water Conditioning**

The hot water treatment method used by the Trust is that of full temperature control as advocated in HTM 04 - 01.

#### **4.22 Surface Temperature**

The accessible surface temperature of heating devices such as radiators and towel rails must be controlled and not exceed 43°C.

Surface mounted pipe work with a temperature in excess of 43°C, which is exposed at low level (that is within 2 metres of the floor) shall be insulated or boxed in.

### 4.23 Cleaning and Disinfection

Water systems will be cleaned and disinfected under the following circumstances:-

System/ Service	Circumstance Requiring Cleaning and Disinfection	When
Domestic cold water tank	New installations. Empty tank re-commissioning. Tank temperature exceeds 20°C. Tank contains moderate sediment, i.e. a complete covering of the tank base. Tank contains moderate corrosion. Contamination of tank by vermin or vermin faeces. Gross organic contamination e.g. large number of dead insects. Regular programme of Inspections/Cleaning Consultant advice - interpretation of microbiological results	Prior to use Prior to use As required Following inspection Ditto Ditto Ditto Annually As required
Domestic cold water distribution system	New installations and small modification/ additions. Contamination of system by vermin or vermin faeces. Gross organic contamination e.g. large number of dead insects. Consultant advice - interpretation of microbiological results.	Prior to use As required As required As required
Domestic Hot water calorifier	New installations and modifications / additions. Calorifier falls below 45°C. Empty calorifier recommissioning/Insurance Inspections Contamination of header tank by vermin or vermin faeces. Regular programme of Inspections/Cleaning. Consultant advice - interpretation of microbiological results.	Prior to use As required As required Following inspection Annually As required

System/Service	Circumstance Requiring Cleaning and Disinfection [cont'd]	When
Domestic Hot water distribution system	New installations and modifications / additions.	Prior to use
	Contamination of header tank by vermin or vermin faeces.	Following inspection
	Consultant advice - interpretation of microbiological results.	As required

#### 4.24 Summary checklist for hot and cold water services.

HTM 04-01 Recommended test frequencies for water services in Trust premises are listed in the table below:

System/Service	Task		Frequency
Domestic cold water tank	Incoming mains cold water temperature		Six monthly
	Tank water temperature		Six monthly
Domestic cold water outlets	Sentinel tap temperatures	All systems	Monthly
	Temperature at representative number [20%] of taps on a rotational basis		Annually
Domestic hot water calorifiers	Flow and return temperature	All systems	BMS and Monthly
Domestic hot water outlets	Sentinel tap temperatures	All systems	Monthly
	Temperature at representative number [20%] of taps on a rotational basis		Annually
Thermostatic mixing valves	Inlet temperature		Six monthly
	Outlet temperature		Six monthly
Showerheads	Dismantle, clean and descale showerheads and hoses		Quarterly



#### 4.25 Water Temperature Checks HTM 04-01

Temperature checks on the calorifier and distribution system should be carried out as detailed below on a monthly, six monthly and annual basis.

Use of a calibrated digital thermometer with a touch and immersion probe is recommended.

Temperature measurement equipment and water sampling equipment will be calibrated on an annual basis and the certification of calibration held at the Directorate of Estate Management offices.

Calibration service providers shall be accredited via UKAS calibration

Although the HSE recommends spot temperature checks, a temperature excursion limit of less than 20 minutes should be adopted, therefore continuous monitoring will be necessary in certain circumstances. The frequency of such monitoring to be based on a risk decision [i.e. balance risk, cost and difficulty for the system].

Cold water storage tank temperatures should be checked during periods of high ambient temperatures [e.g. afternoons between June and August], water temperatures should be no greater than 20°C. At the same time, the furthest and nearest draw off points in the system should be checked to ensure that the water distribution temperatures are less than 20°C within 2 minutes of running the water [at full flow]. A similar temperature check regime should be undertaken during the winter months to identify the performance of cold water distribution systems and the impact of heat gain from heating systems.

*Hot and cold water distribution temperatures from sentinel taps:*

For domestic hot water services, these are the first and last taps on a re-circulating system. For cold water systems or non-recirculating hot water systems this is the nearest and furthest taps from the storage tank.

For cold water outlets, the temperature should be below **20°C** after two minutes of running the water. For hot water outlets, the temperature should reach **55°C** within a minute of running the water.

*Calorifier flow and return temperatures:*

Outgoing water from the calorifier should be at least **60°C**, and water returning to the calorifier should be at least **50°C**. These temperatures can be taken from adequately calibrated temperature gauges fitted to the vessel and return pipework. If temperature gauges are not fitted, then suitable calibrated surface temperature probes may be used.

*Input temperature to thermostatic mixer valves:*

Where fitted, the input temperatures to thermostatic mixer valves should be at least **55°C** within a minute of running the water. Outlets with TMV's should be monitored on a sentinel basis as detailed above.

*Incoming mains cold water:*

Where there is a cold water storage tank, this should be measured at the ball valve outlet. The water should preferably be below **20°C**. However, during a prolonged hot summer the incoming water may rise above this temperature. Under the Water Supply



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[Water Quality] Regulations, water utilities are permitted to supply water to premises at temperatures up to **25°C**. If incoming water temperatures are above **20°C**, the water undertaker should be advised to see if the cause of the high temperature can be found and removed.

Monitoring should ideally be carried out so that one check takes place in the summer months and the other in the winter months.

*Representative number of taps on a rotational basis:*

In order to ensure that the whole system is reaching satisfactory temperatures for Legionella control, the outlet temperatures should be taken from a representative number of outlets [20% per annum] other than sentinel taps.

For cold water outlets, the temperature should be no greater than 20°C within two minutes of running the water. For hot water outlets, the temperature should reach 55°C within a minute of running the water.

**4.26 Non-Compliance**

Where monitored water temperatures fail to satisfy the criteria described, for whatever reason, the Responsible Person [Water] shall be informed and will produce a Non-Compliance Report with remedial actions that must follow, reporting to Trusts Workstream 5 Meeting [Infrastructure and Environment Monitoring Group]

Where there is a failure to comply with the testing regime, the Responsible Person [Water] shall be informed and will produce a Non-Compliance Report with remedial actions must follow, this is to be included in the quarterly report and also be reported to Trusts Workstream 5 Meeting [Infrastructure and Environment Monitoring Group] The monthly report would feed into the annual report.

If non compliance issues represent significant increase in the level of risk from legionella, the Responsible Person [water] is to co-ordinate engineering and clinical actions.

**4.27 General Microbiological/Legionella Sampling in Hot/Cold Water Systems**

Samples for general microbiological testing i.e. total aerobic bacterial counts at 22°C and 37°C, coliforms and E.coli are taken:

- One week following handover of a new building or water system
- In response to taste or odour or sustained discoloured water complaints

When such samples are taken, a mains supply sample should be taken as a control, to verify whether the supply could be the source of any identified problems. The water supplier is also contacted for distribution zone water quality data, for the same reason.

Samples for Legionella testing are taken:

- Weekly from hot water systems where control levels of the treatment regime, ie temperature in this case, are not consistently achieved – these samples should be taken until the system is brought back under control

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- When an outbreak is suspected or has been identified
- Regularly where a department specialises in services for “high vulnerability” healthcare patients

The following areas have been identified by Infection control as accommodating “high risk” patients and as such will be monitored by the WSQG (see appendix 5).

Hospital	Location
Torbay	Turner Ward
Torbay	Ricky Grant Unit

Typically the following minimum samples will be taken:-

- Cold tank and furthest outlet
- Calorifier flow or nearest outlet and furthest outlet
- Additional random samples

HTM 04-01 Action Levels for Legionella in Hot and Cold Water Systems

Legionella Bacteria [cfu/litre]	Action Required
More than 100 but less than 1000	Either: If only one or two samples are positive, system should be resampled. If a similar count is found again, a review of the control measures and risk assessment should be carried out to identify any remedial action to be taken.  Or: If the majority of samples are positive, the system may be colonised with Legionella. Disinfection of the system should be considered but an immediate review of control measures and risk assessment should be carried out to identify any other remedial action required.
More than 1000	The system should be resampled and an immediate review of the control measures and risk assessment carried out to identify any remedial action, including disinfection of the system. Retesting should take place a few days after disinfection and at frequent intervals thereafter until a satisfactory level of control has been achieved.

Samples for Legionella shall be tested by a UKAS accredited laboratory that takes part in the HPA Water Microbiology External Quality Assessment Scheme for the isolation of Legionella from water.

#### **4.28 Records – Log Books**

To ensure that precautions continue to be carried out and that adequate information is available for checking what is done in practice, a record should be kept and maintained for at least five years showing the information specified in the HSC Acop L8. Part 1 para 67 & HTM 04-01 para 5.47

Precautionary measures and treatments, monitoring results and remedial work should be logged and signed or initialled by the person who has carried out the work. Sufficient information should be recorded to show what measures have been taken and how they have been monitored.

The detailed information required in the log will depend on the type and complexity of the system or water service to which it applies.

The purpose of a Log-Book system is to improve the efficiency and effectiveness of installation and maintenance, and also to provide a record of various tasks and observations so that the plant history can be reviewed at any time by the maintenance staff.

It will prove essential to the maintenance engineer in the operation of a planned plant maintenance scheme, and, if properly followed, will prevent unacceptable conditions developing as a result of ineffective maintenance.

The Log-Book will:

- Identify the installation requiring attention and how it operates
- Record results of the initial commissioning (if available) and any re-commissioning so that observations made during maintenance checks can be compared
- Define the maintenance task or observation required and the frequency
- Provide for the recording of maintenance observations and results and for comments to be made in respect of any defect seen during the inspection. This facility should exist for each item of plant individually and for overall system observations
- Provide preliminary guidance on fault diagnosis and checking to assist with immediate on-site correction or adjustment
- Provide for, and make reference to, any separate observation sheet required to record extensive or abnormal observations which cannot be noted on the routine inspection sheets

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- Facilitate cataloguing and cross-referencing to other Log-Books for plant/installations on the same Site (for example, the refrigeration plant, the chilled water installation, the air conditioning plant and the heat source).
- Provide dates and results of inspections, tests and all associated works and procedures
- Provide dates for next scheduled inspection, test and associated works visits
- Include copies of all risk assessments for the system/installation

Details of operational and functional tasks must be drawn up for the site by the Responsible Person [Water]. These, together with the completion of Log-Books, will enable a proper historical record to be compiled of all works carried out and observations made.

Frequencies for water temperature sampling/inspections are to be as required in HTM 04-01, they may be increased to suit the operation of the system on site, its location, the design parameters and particular provisions, for example manual operation rather than automatic control methods.

Temperature Records, electronic database or hard copy, should be readily able to support trend analysis

The user's needs must be considered before commencing any operational or maintenance tasks and the timing for these tasks must be considered and carefully planned in order to minimise inconvenience.

**4.29 Retention Period**

The following types of records are to be kept at the Estates Department:-

Record	Retention Period (L8 Part 1 para 67 & HTM 04-01 para 5.47)
This policy and procedures document	Throughout the period for which they remain current and for at least two further years.
Risk assessments	
Risk minimisation scheme and details of its implementation	
Monitoring, inspection, test and check results, including details of the state of operation of the system	At least five years
System/Installation Log Book	At least five years

**4.30 Schematics**

Drawings and schematics are to be held in the Estates computer drawing database. The database will allow specific drawings/schematics to be produced on request.

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Water system schematics are produced for all hot and cold water systems, with the exception of point of use water heaters and small tenanted domestic premises served by individual single-pipe water systems. The schematics show the storage systems in plant rooms and tank rooms. Distribution schematics may also be produced.

The complexity of schematics will depend upon the outcome of legionellosis risk assessments.

For each water system that presents a risk from *Legionella* bacteria, a schematic or drawing shall be held, showing:

- Origin of water supply
- General layout of the system with point of use location listed by room description (e.g. Side Room 2 or Bay 1 etc) as applied by the users
- How the system operates
- All associated storage and header tanks
- All standby equipment
- Any parts of the system that may be out of use temporarily
- Any problem areas such as dead legs
- Regular operation and test points

These schematics/drawings may also show:

- All system plant, e.g. water softeners, filters, strainers, pumps, non-return valves and all outlets, for example showers, wash hand basins etc
- All associated pipework and piping routes.

Facilities staff [estates and projects], ensure that any changes to the domestic water systems and associated equipment are recorded so that the CAD database is kept up to date. The relevant form is completed for each modification. The form is forwarded to the Maintenance Project Manager, for appropriate action.

Drawings/schematics are also checked to coincide with risk re-assessment, to ensure that they are up to date.

System schematics are displayed in a frame in the relevant plant room, complete with a valve schedule.

## **5 TECHNICAL PROCEDURES**

### **5.1 Tank Cleaning Procedure**

Members of staff either of the Trust, or contract staff shall not be permitted to enter any water storage system [i.e. tank, calorifier] or AHU, if they are suffering or have recently

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suffered from any gastric or other communicable illness, or a condition which may result in their increased susceptibility to legionellosis.

It is the responsibility of the individual to inform their supervisor immediately if applicable.

All tanks are classified as potable water tanks.

The Supervising Officer shall notify and agree with all users of the proposed line of action, and of any disruption or modification to service. The Supervising Officer being the individual responsible for the management of the task in question.

All equipment and tools to be employed during the cleaning and disinfection process should be disinfected in a high concentration of chlorine solution prior to commencement of the process.

### **5.2 The Process Steps [Free Residual Chlorine]**

Isolate and shut down the cold water storage tank and remove the cover or inspection hatch. The operator shall display warning labels in and around the plant room stating chlorination in progress.

The tank shall be examined visually for signs of corrosion [if applicable], debris and biological growth. The water storage temperature and any such defects identified are recorded for report to the Responsible Person [Water].

Permission must be obtained from the relevant water authority before dumping the tank contents. The relevant water authority will need to be informed of the volume to be discharged, any further quantities of chlorinated water are to be dumped as a result of tank cleaning should be included. It may be necessary to neutralise the chlorine with sodium thiosulphate before dumping.

Tank cleaning shall be performed using non-abrasive cleaning materials.

Protective clothing, footwear, face goggles and masks are to be employed. These items must be specific to the task of cleaning and chlorination, and must not have been used for other activities.

Where tanks are to be painted, only paints or coatings and materials that are recognised and approved by the WRAS (Water Regulations Advisory Scheme) and detailed in "The Water Fittings and Materials Directory" shall be employed. The specification for any such product must be submitted to the Responsible Person or their nominated deputies for their approval prior to use.

Details of all cleaning and painting materials shall be listed on the cold water tank inspection record sheet

On completion of the cleaning / painting exercise, and after the necessary paint maturing period, if required, the tank shall be thoroughly flushed and washed out with water, refilled to the tanks normal working level and dosed to a level of 50 ppm free residual chlorine. The tank shall be left to stand for a minimum period of one [1] hour. During this period the level of free chlorine shall be monitored and maintained at 50 ppm.





- Mixing valve failure causing back feeding - non return valves are recommended
- Domestic hot water system venting over the tank

The person identifying, or receiving report of a tepid cold water occurrence must notify the Responsible Person [Water] as soon as the problem is identified, and an appropriate Estates Department Representative should be identified to be responsible for dealing with the occurrence.

The Estates Department Representative shall verify the problem by taking the water temperature of the appropriate cold water storage tank. If the cold water storage temperature is greater than 20°C, the temperature of the incoming mains cold water should be taken.

If the incoming water is 19°C or greater, and the tank water is no greater than 2°C higher, no actions are necessary unless the incoming water exceeds 25°C [in which the Responsible Person [Water] will contact the Water Undertaker].

If the water temperature in the tank is greater than 2°C higher than the incoming water supply, the following actions should be implemented:

- The reason for failure must be identified and rectified as soon as possible
- If the cause of the warm water is identified as heat gain to the tank, drain the tank contents and clean if necessary. A permanent solution, such as ventilation for the plant room or reducing the water storage volume must be implemented. In the case of “high risk” patient areas, consideration should be given to elimination of storage, supplementary water treatment and/or refrigeration of a re-circulating cold water system
- If the reason for warm water is found to be due to ingress of hot water [i.e. from the DHW system or similar source], the Estates Department Representative shall inform the users of the failed system that they must not draw off any cold water [and hot water if a single domestic hot water header] from the affected system until further notice
- Chlorine disinfection of the tank and distribution system shall be carried out in accordance with the tank cleaning/disinfection procedure
- The tank shall be brought back into service, as detailed in the tank cleaning/disinfection procedure
- The users shall be informed that the system is back in operation
- The Estates Department Representative shall complete an Incident Report Sheet. An entry will be made onto the plant room log book, and a copy of the Incident Report placed in the Estates incident reporting file

## 5.4 Calorifier Flushing



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Each calorifier should be flushed quarterly through its drain valve by opening the drain valve three [3] times, each time for a three [3] minute period. The hose from the drain valve is to discharge to a container filled with clean water as described in the section dealing with the safe discharge of stagnant water.

Calorifier flushing should be carried out after temperature checks on the calorifier and system have been completed. The calorifier maintenance record form should be completed.

## 5.5 Calorifier Maintenance

The cleaning procedure for calorifiers is as follows:

- The calorifier shall be taken off line by isolating the service valves
- The calorifier shall be heated up until the contents have reached 70°C and held at this temperature for a period of at least one [1] hour
- The calorifier is drained [with consideration of the Water Authority as before]. The inspection hatch is removed. The drain down time is recorded and a photo of the internal condition is to be taken and held with the record sheet
- The calorifier should be drained with the hose pipe outlet discharging below water level i.e.: into a container of clean water
- The calorifier should then be hosed out to remove any debris, scale or other deposit. Care will be taken to ensure that aerosols are kept to a minimum
- If the calorifier does not have an inspection hatch, the pipework at the top of the vessel should be disconnected to allow the insertion of a high pressure water hose to allow debris to be washed down off internal surfaces
- The internal and external condition of the calorifier and pipework should be examined, any defects should be reported immediately to the Supervisor. The safety valve should be checked, overhauled and re-set as necessary including temperature, altitude and pressure gauges to be checked
- The calorifier can then be re-constructed, ensuring that only materials and compounds approved in the Water Fittings and Materials Directory are employed

On completion of calorifier assembly, the following sequence must be undertaken:

- Refill with cold water
- Drain the calorifier [advice should be sought from the local Water Authority prior to any discharge]
- Refill with cold water, leave cold feed valve open
- Run calorifier at a temperature of 70°C for at least one [1] hour. Test the operation of a high limit cut out system if fitted. Check the temperature of the

calorifier top and bottom with a touch thermometer

- Allow the system to cool down to the operating temperature and put the system back on line immediately
- Adjust any controls as necessary
- Complete calorifier maintenance record form

## 5.6 Stratification Checks

Domestic hot water storage vessels should be subject to water temperature stratification checks on a bi-annual basis [i.e. every two years] for each calorifier. These checks should extend over a period of seven [7] days using a logging device. Logging should also be used where de-stratification pumps have been fitted to establish that such a pump will ensure that the water temperature at the base of the vessel achieves 50°C.

Logging of calorifier temperatures is not undertaken in small tenanted domestic properties with individual single pipe water systems.

## 5.7 Showers

This section does not apply to showers in small domestic properties which are the responsibility of tenants.

Showers which are rarely used should preferably be removed, or run daily for a 3 [three] minute period.

A memo is to be issued to all Divisional Lead Managers and Department Heads indicating this requirement, and requesting notification of showers for removal. Label all showers "**THIS SHOWER MUST BE RUN DAILY**". A memo should be issued to all users / managers with showers indicating their responsibility to ensure that showers are run on a daily basis.

Shower heads are cleaned and descaled where necessary, on a quarterly basis. Alternatively shower heads may be replaced with new/disinfected ones.

It is recognised that point-of-use shower head filters to 0.2um [Pall filters] do not eradicate Legionella and risk seeding other parts of the system. Generally they will not be continually used in the long term. In all cases the Responsible Person [Water], in discussion with the DIPC will determine the necessity of such filters.

## 5.8 Domestic Hot Water (DHW) Temperature Less Than 45°C

Whenever the DHW temperature falls below 45°C [NB this is not referring to water from a blended outlet] for any reason, the DIPC will be informed, in writing, by the Responsible Person [Water].

The following procedure must be employed following a reduction of domestic hot water temperature to below 45°C for any reason.

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Such temperature reductions can result from system failures such as:

- Primary heat source failure
- Calorifier water temperature controls failure
- Domestic hot water distribution pump failure
- System shut down for modification or repair

The procedure should be applied as follows:-

<b>Circumstance</b>	<b>Action</b>
Temperature under-performance	Commence Legionella testing. Upgrade the system to avoid future underperformance. Full thermal disinfection.
Routine shutdown for refurbishment/upgrade, involving an outage of < 6 hours.  Or  Minor failure, involving an outage of < 6 hours.	Pasteurise calorifier only.
Major failure eg steam failure or power failure, resulting in an outage of > 6 hours.	For power failure follow reset procedure. Full thermal disinfection.

In the event of a reduction in domestic hot water temperature to less than 45°C, the Responsible Person [Water] and the estates department mechanical supervisor should be notified immediately. It may be wise to fit calorifiers with an alarm system. This will be relatively easy to achieve for vessels on a BMS system. The reason for failure must be identified and rectified as soon as possible.

The Responsible Person [Water] or nominated deputy shall notify the users and the DIPC of the failed system, and that they must not draw off any hot water from the affected services until further notice.

The user shall ensure that their staff members are aware of the situation, and that in turn shall prevent patients from using affected services.

Thermal disinfection shall be carried out by raising the domestic hot water temperature of the contents of the calorifier to 60°C, and then circulating this water throughout the affected distribution system for at least one [1] hour. Each tap or appliance should be run in sequence until full temperature is achieved [this should be measured]. To be effective the temperature in the calorifier should be high enough to ensure that all distribution outlets receive water at a temperature of greater than 60°C. Ensure the return flow to the calorifier is a minimum of 50°C.

Care must be taken not to exhaust the calorifier during this operation.

The users shall be informed that the system is back in operation.

The Estates Department representative shall complete an Incident Report Record, and an

entry shall be made into the relevant System Log Book

## 5.9 Cleaning Water Systems Within Buildings

**Installations within buildings** - All visible debris and scale shall be removed from the cistern. The cistern and distribution pipework shall be filled with clean water and then drained until empty of all water. The cistern shall then be filled with water again and the supply closed. A measured quantity of Sodium Hypochlorite solution of known strength shall be added to the water in the tank in order to give a free residual chlorine concentration of 50mg/l [ppm] in the water. The cistern shall be left to stand for one [1] hour. After this time period, each draw-off point shall be successively opened working progressively away from the cistern. Each tap and draw-off point shall be closed when the water discharge begins to smell of chlorine. The cistern shall not be allowed to become empty during this exercise. If necessary it shall be refilled and chlorinated as above. The cistern and pipes shall remain charged with chlorinated water for a further one [1] hour.

On completion of this period, the tap furthest from the tank shall be opened and the level of free residual chlorine in the water discharged from this tap shall be measured. If the concentration of free residual chlorine is less than 30 mg/l [30ppm] the disinfection process shall be repeated.

The tank and pipework shall remain charged with chlorinated water for as long as possible, the minimum time period being one [1] hour [existing system], ideally sixteen [16] hours [new system]. However, this may not be possible in areas, which are in use. Time scales shall be agreed on site between the Contractor and Supervising Officer [Systems fed directly off the mains water supply shall have a chemical injection point fitted by others], and then thoroughly flushed out with clean water until the free residual chlorine concentrations measured at the taps are no greater than that present in the supplier's mains water.

On completion of the cleaning exercise, a certificate of cleaning and chlorination shall be issued stating that the system has been cleaned and chlorinated in accordance with BS6700:2006 section 3.

Further details of tank cleaning are presented above.

**5.10 Minor Plumbing Alterations** [fewer than 6 fittings and less than 5 metres of new pipe per service, and no extensive shutdown of water services, as a guide]

Where small alterations or maintenance tasks on water systems have been carried out, then re-commissioning may require no more than thorough flushing of the systems. This can be followed by sampling and analysis of the water if considered necessary by the Responsible Person [Water] or project manager, although this is not expected to be required after minor maintenance-related works such as replacement of individual water fittings. This relaxation is only permissible where the extent of the work is small [fewer than 6 fittings and less than 5 metres of new pipe per service, as a guide] and all fittings and pipe used on the installation are new and EITHER taken from the manufacturer's sealed packing just before use, OR pre-chlorinated immediately before use.

Pre-chlorination can be simply achieved by immersing and agitating the fittings for 5 minutes in a 1,000ppm solution of sodium hypochlorite. This can be made up on site by diluting commercial or household bleach [containing approximately 5% sodium

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hypochlorite] with clean cold water in the ratio of 1:50 [20ml bleach per litre of water]. The COSHH Regulations apply to the use of such solutions at work – a Risk Assessment should be prepared and the appropriate physical precautions must be taken.

To avoid the need to disinfect large systems following relatively minor extensions and alterations, it is recommended that biocide injection points are provided at the point where the new pipework joins the existing system. Biocide injection points take the form of valves, tees and a drain valve or physically removable section of pipe. This enables biocide to be injected into the new section of pipework and circulated or drawn through all new fittings. The removable section must be taken out or the drain valve locked open to prevent any possibility of biocide [a Class 5 fluid] from contaminating the existing fresh water pipework during the disinfection process.

Work should only be undertaken by properly trained, experienced and qualified operatives or Contractors.

### 5.11 Major Plumbing Alterations

On larger installations or where fittings have been re-used and are not new and sealed, the new or altered section of pipework must be cleaned and disinfected by a specialist Contractor using an approved biocide, in accordance with BS 6700.

Major extensions and new buildings must be disinfected before being brought into use, and in many cases it may be more convenient for a specialist Contractor to disinfect the entire buildings systems from the tank or source.

Notification must be made to the Water Undertaker in accordance with the Water Supply [Water Fittings] Regulations 1999. Work should only be undertaken by properly trained, experienced and qualified operatives or Contractors who are accredited under a quality assurance scheme for plumbers [‘Watermark’ scheme or equivalent].

In accordance with standard conditions of contract, the following Certificates should be obtained from the Contractor before new or significantly altered water systems are accepted at hand-over:

- Certificate of Disinfection in accordance with BS 6700
- Results of water analysis from UKAS-accredited Laboratory.

### 5.12 Notification/Procedure for Shutdowns and Alterations to Water Systems

The Responsible Person [Water] will notify the manager of any area expected to be affected by temporary interruption of water supplies at least two weeks prior to the event, or by arrangement in unusual circumstances.

Similarly, for any significant interruption, the Infection Control Department and the Health & Safety Lead should be informed at least two weeks prior to the event. They are to be included in the planning process to carry out clinical risk assessments, review method statements and inform areas affected by the shutdown of procedures to adopt during the shutdown.

## Water Safety Policy

Under the Water Supply [Water Fittings] Regulations 1999 if any of the following are to be done or installed, the Water Undertaking must be notified before commencing the work by the installer:

- Erection of a building or other structure
- Extension or alteration of a water system [other than in a dwelling]
- Change of premises use

Installation of any of the following, other than as a like-for-like replacement:

- Bath of over 230 litres capacity
- Bidet
- Shower unit of a specified type
- Pump or booster
- Reverse osmosis unit
- Water treatment unit
- RPZ valve or other mechanical device [category 4 or 5 fluids]
- Garden watering system
- Water system laid outside a building
- Construction of a pond or swimming pool

The Water Undertaking has 10 days to grant or withhold consent and/or impose conditions. After 10 days have expired and nothing has been heard, consent is deemed to have been given. Approved contractors [members of 'Watermark' or similar approval schemes] are exempt from certain of the above, but on completion of the work they must send a copy of the Contractors Certificate to the Water Undertaking.

**APPENDIX 1 – Maintenance Checks for Other Water Systems**

<b>System/Service</b>	<b>Task</b>	<b>Frequency</b>
Water softeners	Clean and disinfect resin and brine tank – check with manufacturer what chemicals can be used to disinfect resin bed	As recommended by manufacturer
Emergency showers and eye wash sprays	Flush through and purge to drain	Weekly as a PPM item.
Sprinkler, wet riser and hose reel systems	When witnessing tests of sprinkler blowdown, wet risers and hose reels ensure that there is minimum risk of exposure to aerosols	As directed
Dental equipment	Drain down and clean	At the end of each working day



**APPENDIX 2 – Checklist for New Water System Designs**

		Yes	No
<b>General Design and construction</b>			
1	Does the Design and construction comply with :- HTM 04 – 01 (Part A) The Control of Legionella bacteria in water systems (L8) NHS Model Engineering Spec C 07 Heating, hot and cold water systems NHS Model Engineering Spec D 08 Thermostatic mixing valves <i>The Water Supply (Water Fittings) Regulations 1999</i> <i>The Water Supply (Water Quality) Regulations 2000</i>		
2	If you are fitting a new system, do any of the materials or fittings used in the water systems support the growth of micro-organisms?		
3	Has a formal risk assessment been carried out on the proposed installation		
4	If fitted, are thermostatic mixing valves [TMVs] sited as close as possible to the point of use, i.e. equal to, or better than HTM 04 - 01		
5	Does the design avoid the use of spray taps & flexible connections		
6	Does the installation use the Trusts standard for sanitary equipment i.e., Taps, wash basins & TMV's ( HTM 64, DO8 etc)		
7	Does the overall design facilitate easy access for routine maintenance of valves and pumps without the need to remove heavy panels or to work at high level.		
<b>Design and construction: Cold water system</b>			
8	Does the design ensure that the length of feeding connections from the running main are minimised and that they are less than 5 mtrs for cold water systems.		
9	Is there a high use outlet situated at the end of the system to ensure stagnation does not occur in the running main		
10	Has cold water storage been assessed and minimised, i.e. holds enough for a day's use only?		
11	Is piping insulated and kept away from heat sources [where possible]?		
12	Is the cold water tank:		
	* fitted with a cover and insect screen[s] on any pipework open to the atmosphere?		
	* located in a cool place and protected from extremes of temperature?		
	* accessible?		
<b>Design and construction: Hot water system</b>			
13	Does the design ensure that the length of feeding connections from the point of circulation to the tap or outlet are minimised and that they do not exceed a maximum of 2 mtrs for hot water systems		
14	Does the calorifier storage capacity meet normal daily fluctuations in hot water use while maintaining a storage temperature of at least 60°C and at the most distant outlet, a temperature of at least 55°C?		
15	Are the hot water distribution pipes insulated?		
16	If more than one calorifier is used, are they connected in parallel?		
17	Does the calorifier have the following fitted:		
	* a drain valve & an access panel ?		



Water Safety Policy

	* a temperature gauge on the inlet and outlet?		
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### APPENDIX 3

#### **Flushing Procedure – for poorly used outlets** (those not used every day for at least 2 minutes)

The risk of Legionella existing in water systems can be significantly reduced by ensuring that every hot and cold tap outlet is used regularly, so that water is not able to 'stagnate' in the pipes over a lengthy period. Where water is mixed, i.e. blending valves, further opportunities arise for deterioration in water quality.

To facilitate this, managers of all wards and departments must comply with the following precautions:-

#### **General Wards and departments;**

Flushing of both the hot (or blended) and cold water supplies at **poorly used outlets** should be carried out twice a week [e.g. Monday & Friday] for 3 minutes and the flushing recorded on a log sheet in a log book maintained by the staff in the area for auditing purposes.

Showers create more aerosols than other sanitary appliances, therefore ensure that all showers in clinical areas are either used or flushed every working day.

#### **High Risk Areas;** Torbay Hospital, Turner Ward and Ricky Grant Unit

In high risk areas every outlet (sinks, wash basins and showers) must be used every day for at least 3 minutes, where this is not achieved it should be formally flushed by the staff and the actions recorded in a log book for the purpose.

The level of flushing in high risk areas will be monitored and reviewed by the Risk Review Group and may be modified in the light of its findings.

The flushing should follow the procedure outlined below:

- Identify areas/outlets to be flushed. Ensure that the system/outlet can be flushed safely and in a tidy manner into an appropriate drain if not plumbed for drainage
- Ensure that the purging of water from outlets does not create an unnecessary amount of aerosol at least no more than would be created when outlet is operated normally
- Ensure that "splash-back" is minimised, where practicable, by placing a sponge or another material capable of absorbing some of the force of the water against the surface of the appliance
- Flush outlets at both hot and cold water settings in turn for a minimum of 3 minutes or for a period of time necessary to draw water from the outlet at temperatures exhibited throughout the rest of the system
- Where showers need to be flushed, it is important to ensure that, where practicable, the shower-head is removed in order to reduce the potential of aerosol production

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- Consider whether the system/outlet can be removed negating further flushing
- Log all procedures and results
- Report any defects to the Estates department Maintenance helpline on ext 54426

**APPENDIX 4**

**Legionella compliance / exception report to WS5 for Month of \_\_\_\_\_**

Are any legionella related estates projects not meeting the agreed timetable ? Y/N

If Yes, comments / actions taken

Are there any significant alerts from the Building Management System? Y/N

If Yes, comments / actions taken

Have any scheduled PPM checks in the programme not taken place? Y/N

If Yes, comments / actions taken

Have any PPM checks found temperatures out of range or other conditions indicative of possible Legionella problems? Y/N

If Yes, comments / actions taken

*Overall Assessment for Workstream 5 Performance Report Dashboard for the Month  
(Strike out non applicable)*

**RED** = Significant risk remains after application of action plan

**AMBER** = Off track, action plan in place – no significant risk

**GREEN** = On track

Signed..... Responsible Person [Water]

Date.....

**APPENDIX 5**

**Water Safety Quality Group Summary Report** (if taken place in last month)

Clinical area **Turner Ward & Ricky Grant Unit**

Is there anything to suggest that the design and condition of the estate, or water outlet usage, is insufficient for the patients / visitors / staff in that area? (Result of Risk assessment tool)

Y/N

If Yes, comments / actions taken
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Clinical area \_\_\_\_\_

Is there anything to suggest that the design and condition of the estate, or water outlet usage, is insufficient for the patients / visitors / staff in that area? (Result of Risk assessment tool)

Y/N

If Yes, comments / actions taken
----------------------------------

Clinical area \_\_\_\_\_

Is there anything to suggest that the design and condition of the estate, or water outlet usage, is insufficient for the patients / visitors / staff in that area? (Result of Risk assessment tool)

Y/N

If Yes, comments / actions taken
----------------------------------

Clinical area \_\_\_\_\_

Is there anything to suggest that the design and condition of the estate, or water outlet usage, is insufficient for the patients / visitors / staff in that area? (Result of Risk assessment tool)

Y/N

If Yes, comments / actions taken
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**APPENDIX 6**

## Water Systems Quality Group

### TERMS OF REFERENCE

#### 1. INTRODUCTION

The purpose of the Water Systems Quality Group is to provide a strategic lead to control the risk from water borne bacteria and ensure the requirements of the ***Prevention and Control Water Borne Infections (including Legionella Bacteria and Pseudomonas aeruginosa) and maintenance of Water Quality Policy*** is maintained and its implementation monitored; thus ensuring the safe use of all water systems throughout the two Trusts and associated properties where it has responsibility for such water systems

Both Trusts recognises its responsibilities under the Health and Safety at Work Act 1974 and the primary objective of this committee is to ensure the safety of patients, staff, visitors, contractors and anyone else who comes into contact with medical gases through the activities of the Trust

##### 1.1 The Water Systems Quality Group will:

- Define how the two Trusts intends to manage the potential risk from legionella and other water borne bacteria in a manner that complies with both legislation and good practice
- Set a 3 year Strategy on Water Safety Management
- Provide a summary report to the Workstream 5 Integrated Governance Group.
- Provide written report to the Infection Prevention Control Committee every 2 years
- Take all reasonable measures to ensure the safe provision of Water systems to users
- Monitor compliance with the Trust Policy
- Annually review the policy
- Monitor compliance with recognised standards, best practice and guidance on Legionella and water borne bacteria

#### 2. Accountability

The Committee will be a sub-group of the joint Torbay and Southern Devon Health and Care NHS Trust South Devon Health NHS Trust Infection Prevention Control Committee. And will also report to Workstream 5 a sub-committee of the Trust Board

#### 3 The group will aim to meet:

- Bi-monthly to review maintenance and management procedures and any water related issues arising
- Annually to formally review the Policy
- On an ad-hoc basis if any work is planned requiring significant shut-downs or disruption. Or as a result of positive counts being received following the taking of water samples. The Responsible Person (Water) will arrange these ad-hoc meetings.

#### 4. REMIT OF THE GROUP

The remit of the Water Systems Quality Group will include:

- Monitoring, control and auditing of the Trusts flushing procedures.
- To monitor and review results from water samples taken as part of the Silver Copper water treatment system
- Decide on the course of action to be taken when positive Legionella/Pseudomonas counts received

## Water Safety Policy

- Review and amend the policy taking into account any changes to legislation and changes to Trust specific procedures
- Ensure staff involved with the management and control of the Trusts water systems have received adequate training and are competent in their roles
- To seek external expert advice when necessary.
- Agree a schedule of clinical areas where “high risk” patients are being treated
- To develop, review and monitor the effectiveness of the Trust-wide policy for Water Systems Management in accordance with Health Technical Memorandum (HTM) 04-01 Parts A & B, HSE Approved Code of Practice L8, and the Health and Safety at Work Act.
- The Group will also act as a forum for related matters.

## 5. MEMBERSHIP

The Committee will include appropriate staff members from Infection Control, Estates, Health and Safety and clinical staff

Other staff groups will be co-opted as and when required. The Group will be chaired by the Responsible Person for Water Systems

- Responsible Person (Water) SDHT
- Deputy Responsible Person (Water) SDHT
- Responsible Person (Water) RDE
- Director of Infection Prevention Control SDHT
- Director of Infection Prevention Control or representative TSDHC
- Trust Health and Safety Advisor
- Nominated Matron
- Infection Control Nurse.
- Water Systems Maintenance Technician