Operational Procedure for the Safe Management of Water (Including Legionella, Pseudomonas and Scalding)

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**POLICY SUMMARY**

EPUT is committed to providing water systems and services that -

- Meet the requirements of ACoP L8
- Meet the requirements of HTM 04-01
- Provides wholesome water within all trust buildings
- Will not put the end user at risk of scalding or infection

The Trust monitors the implementation of and compliance with this policy in the following ways:

The water quality group will monitor implementation and compliance. Quarterly reports will be submitted to HSSC.

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The Director responsible for monitoring and reviewing this policy is

Associate Director of Estates & Facilities
Operational Procedure for the Safe Management of Water
(including Legionella, Pseudomonas and Scalding)

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Assurance Statement
This operational procedure sets out the Trust’s approach to managing water systems and controlling Legionella in its premises and to ensure all staff are aware of the important role they have regarding water quality. By implementing this procedure the Trust will be compliant with the requirements of the Department of Health mandatory requirements for managing legionella, pseudomonas and other water borne pathogens, together with safe water temperatures in health care premises. The Trust will also discharge its duty under health and safety legislation relating to water quality and COSHH.

1.0 INTRODUCTION

1.1 AIM:

1.1.1 It is the responsibility of any person employed by Essex Partnership University NHS Foundation Trust, hereinafter known as EPUT, in whatever capacity to comply with the requirements of this Procedural Document.

1.1.2 This Procedural Document must be used in conjunction with the current version of EPUT’s “Policy Document – Water Safety Management (including, Legionella, Pseudomonas and scalding)”.

1.1.3 In addition, this Procedural Document provides the infrastructure for the implementation of EPUT’s Legionellosis Management & Control Program. It is expected that this Procedural Document be complied with by EPUT employees, on all EPUT sites, and by all appointed contractors, in whatsoever capacity, with or without contractual agreements.

1.1.4 Management Procedures will seek to ensure that compliance with this Procedural Document is continuing and not notional.

1.1.5 As part of EPUT’s commitment to provide a fully compliant service, it is essential that all regular tests and checks set out in this document shall be carried out even if they cause minor disruption to hospital services, and that comprehensive records will be maintained.

1.2 SCOPE OF OPERATIONAL PROCEDURE:

1.2.1 The scope of this Operational Procedure shall extend but not be limited to:

i. Domestic Cold Water Services – Storage and Distribution

ii. Domestic Hot Water Services - Generation Storage and distribution

iii. Taps, showers, bib taps, etc.

iv. Thermostatic Mixing Valves (TMV) / Thermostatic Mixing Taps (TMT)

v. Drinking Fountains

vi. Ornamental Fountains/Ornamental Water Displays

vii. Irrigation Systems

viii. Fire-fighting Systems

ix. Dental Chairs

x. Nebulisers
xi. Wet Air Conditioning systems and/or equipment
xii. Portable humidifiers
xiii. Portable Air Conditioning Units
xiv. Lathes/Cutting Tools
xv. Any other water system that may present a risk

1.3 PRIMARY METHOD OF BACTERIAL CONTROL:

1.3.1 EPUT will employ thermal disinfection as the primary method of bacterial control, to manage and control the risk of bacterial proliferation. This is achieved by maintaining the following temperatures:

- Cold water at temperatures of <20°C
- Cold Water Services (CWS) Distribution at <20°C.
- Stored hot water at ≥60°C.
- Hot Water Services (HWS) Flow at ≥60°C and return at ≥55°C
- HWS Distribution at all outlets at ≥55°C.

EPUT shall also use usage evaluation and flushing and maintain systems as clean as possible in addition to temperatures to prevent the proliferation of bacteria.

There may be circumstances when the primary control measures of bacterial control are shown by the PPM Program Monitoring Tasks to be failing. At these times the water quality shall be maintained by the use of shot-dosing of a suitable disinfecting agent (disinfection), the levels of which must be maintained within the recommended limits for achieving disinfection as specified within the current editions of BS8558:2011 and L8 – The Control of Legionella bacteria in water systems – Approved Code of Practice & Guidance. Legionella Samples shall also be taken until the systems are back under control.

The Water Quality Group will continue to consider new developments and improvements in the field of Legionellosis Management & Control, to ensure the best possible methods of control are in place.
2.0 SYSTEM/PLANT, INSTALLATION AND MAINTENANCE

2.1 GENERAL DESIGN AND INSTALLATION CONSIDERATIONS

2.1.1 All designs must be carried out and presented in accordance with all relevant and current Guidelines, European and British Standards, best-practices, Health Technical Memoranda, Health Guidance Notes and National Health Service Model engineering specifications.

2.1.2 The systems shall be carefully designed to eliminate or minimise aerosol production and excessive water retention. They must also be designed to be readily drained and cleaned.

2.1.3 No materials used in construction shall include those that are known to harbour or provide nutrient for bacteria. Any materials that come into contact with the water in a hot or cold water installation shall comply with the requirements of the Water Supply (Water Fittings) Regulations 1999. Further information on the selection of materials can be found in BS8558:2015 and BS6920.

2.1.4 All TMVs installed must be compliant with the National Health Service Model engineering specifications D08 Thermostatic mixing valves (Healthcare Premises) and the TMV3 Approved Scheme and installed in accordance with all relevant and current Guidelines, European and British Standards, “best-practices”, Health Technical Memoranda, Health Guidance Notes and National Health Service Model engineering specifications.

2.1.5 It is EPUT’s policy that no flexible hose connections shall be fitted to any new Healthcare buildings or refurbishments commissioned by or on behalf of EPUT unless specifically required and approved by the Water Quality Group.

2.1.6 Where flexible hoses must be used (e.g. on essential equipment such as hi-low baths) they must be lined with a suitable alternative to EPDM, as well as being Water Regulations Advisory Scheme (WRAS) approved. Care should be taken to avoid kinking or distorting them during installation. They should be subject of periodic replacement under the PPM program.

2.1.7 Risk assessments shall be reviewed regularly and whenever there are changes to the patient user group or alterations made to the potable water system.

2.1.8 Where water supplies are required for specialist systems such as endoscope cleaning installations, dialysis units etc., and the designer shall consult the hospital infection control team to establish any specific water treatment requirements for the process, and also the local water undertaker to clarify any special precautions that may be necessary, such as backflow prevention devices.

2.1.9 The systems shall be maintained in a clean and sound condition and must be easily and safely accessible.
2.1.10 All systems shall be frequently used or systems and outlets must be flushed at least weekly. Flushing frequency may increase based on the findings of the risk assessment or where there are high risk users.

2.1.11 Occupants and users of an area will be responsible for carrying out the regular flushing of little used outlets. Where an area is vacated for a period greater than 7 days, the responsibility for flushing will be taken over by the Estates Department.

2.1.12 Where an area is occupied for less than 7 days/week, the ‘Users’ shall include as part of their assessment the risks from not using the systems on unoccupied days and the precautions required on operating the system after regular periods of stagnation.

2.1.13 All plant and distribution pipe-work (where accessible) shall be clearly labelled.

2.1.14 No dead legs shall be permitted on the domestic and other water systems. All identified dead legs must be removed.

2.2 COLD WATER STORAGE TANKS

2.2.1 The removal of cold water tanks and placing cold water services on direct mains fed system shall be considered.

2.2.2 Cold water storage tanks shall be constructed from non-deleterious materials which must be WRAS approved.

2.2.3 Cold water storage tanks shall be designed and installed in accordance with the current Water Supply (Water Fittings) Regulations 1999 and installed in appropriate and suitable locations to allow easy and safe access to facilitate inspection and maintenance.

2.2.4 Sectional cold water storage tanks shall be designed with external assembly flanges and self-draining profiles, since this arrangement facilitates easy cleaning of internal surfaces.

2.2.5 Externally located sold water storage tanks shall be suitably protected from environmental conditions.

2.2.6 Cold water storage tanks shall be protected from the ingress of light, insects and birds.

2.2.7 Cold water storage tanks shall be sized and arranged so as to minimise retention time of stored water (12 hours maximum), and therefore to increase the rate of stored water exchange.

2.2.8 Cold water storage tanks shall be subjected to a periodic “need” test which requires the user or estates maintenance team to question the presence of each unit and consider its removal if the services it supplies can be, equally well, supplied by converting the systems to domestic Mains fed only.
2.2.9 Each unit shall be subjected to an annual drop test to determine capacity requirements and ensure stagnation is not occurring.

2.2.10 All associated pipework and valves shall be adequately insulated and clearly labelled to identify their purpose.

2.2.11 Delayed-action ball valves shall be fitted (where practicable) in order to help avoid stagnation of water.

2.2.12 Where booster pumps are to be installed, a break cistern will be required between the mains supply pipe and the pumps. This is required in order to comply with the Water Supply (Water Fittings) Regulations 1999 with regard to prevention of backflow. Control of the pump(s) should be fully automatic in operation and controlled by pressure sensors. Where two or more pumps are installed, the design flow should be achieved with one pump stationary (or out of service). Automatic control should be provided to cyclically and sequentially control all pumps to ensure that each is regularly brought into service. If this is not possible, documented procedures shall be in place to ensure equal usage is achieved.

2.2.13 Cold water storage tanks shall be maintained in good condition, clean from excessive corrosion, sludge deposition, scale deposition.

2.2.14 Stored water shall be maintained at a temperature of less than 20°C with no significant heat gain in the tank or cold water system.

2.2.15 Cold Water Storage Tanks shall be subjected to annual monitoring to include

   i  Temperature monitoring,
   ii General physical inspections.

2.2.16 Cold Water Storage Tanks shall be subjected to a clean and disinfection, when the results of the monitoring indicate the need.

2.3 HOT WATER HEATERS AND CALORIFIERS

2.3.1 Calorifiers shall be installed in appropriate and suitable locations to allow easy and safe access to facilitate inspection and maintenance.

2.3.2 Where more than one Calorifier or heating device is used, they shall be connected in parallel, taking care to ensure that the flow can be balanced so that the water temperature from all the Calorifiers exceeds 60°C at all times.

2.3.3 The combined storage capacity and heater output must be sufficient to ensure that the outflow temperature, at continuous design flow (at least 20 minutes) from calorifiers or other heaters, shall not be less than 60°C. This applies to circulating and non-circulating hot water systems.

2.3.4 The positioning of the control and high limit thermostats, cold feed and return water connections must ensure that these temperatures are achieved.
2.3.5 Means shall be taken to prevent warm water entering the cold-feed. A check valve shall be provided in the cold feed, as close to the calorifier as practicable, to prevent such circulation. However, the installation of such a check valve shall not be carried out in systems that use the cold feed for expansion. In these cases, U-bend or S-bend shall be installed in the cold-feed, sufficient distance from the connection to the calorifier, so that water which is warm is not displaced (on heating up) beyond the bend and the vertical pipe rise.

2.3.6 The practice of terminating the air vent over the Cold Water Storage Tank shall be discouraged. The vent shall be arranged to discharge over a separate turn-dish arrangement, with visible Type ‘A’ air gap, sited at a level that takes account of the hydrostatic head of the system. The calorifier or water heater shall be provided with a suitable safety valve of appropriate size and vacuum release arrangement.

2.3.7 Where water quality indicates the need, cathodic protection from galvanic action by means of sacrificial anodes shall be provided.

2.3.8 Calorifiers shall be fitted with a de-stratification pump, where necessary, in order to avoid temperature stratification of the stored water. Some semi-storage/high-efficiency Calorifiers are supplied with an integral pump that circulates water in the Calorifier. De-stratification pumps shall not be fitted to this type of units.

2.3.9 A single circulating pump shall normally be installed in the return. If, for reasons of reliability, two pumps are installed in parallel they shall be arranged to have individual non-return and service valves and be controlled such that each one is brought into operation twice a day.

2.3.10 When Calorifiers are isolated from the system (for whatever reason), the associated distribution system shall be subjected to DAILY flushing. However, this is only necessary when the Calorifier isolated is the sole supply of Hot Water Services (HWS) to that distribution system. Where more than one Calorifier supplies the distribution services, the isolated calorifier shall be drained down and remain drained whilst off line.

2.3.11 A suitably sized drain shall be connected to the base of each calorifier (where practicable).

2.3.12 Calorifiers shall be maintained at the following temperature profiles at all times:

i. Stored and Flow at ≥60.0°C

ii. “Return” at ≥50°C

iii. “Distribution” at ≥50°C

iv. “Drain” at ≥50°C
2.3.13 In order to ensure that the temperatures required to achieve thermal disinfection (≥60°C for the “Flow” and ≥50°C for “Distribution”) are maintained, it is important to ensure that:

i. Ideally, the calorifiers should be allowed to operate continuously ensuring that the heat source is available constantly. Where the Primary Heating Source is not set by a timer, the heating source shall be left ‘on’ at all times.

ii. Where the timers are fitted and operated and cannot be removed, it is important to ensure that the units are allowed to operate at a temperature of (min) ≥60°C for at least 1 hour from, when they come ‘on line’, before any water is drawn from them.

iii. Where a building is to remain un-occupied, the calorifier shall be emptied and pasteurised before being allowed back ‘on-line’.

2.3.14 Calorifiers shall be subjected to a monthly check for “Flow” and “Return” temperature (where applicable). This can be carried out manually or remotely via a Building Management System (BMS).

2.3.15 Combination water heaters shall be maintained such that the cold tank part of the heater is kept clean and at the correct temperature, and the hot tank part maintained at a temperature of ≥60.0°C allowing for distribution temperatures of ≥50.0°C. A screened vent and an insect/rodent overflow screen shall be fitted to the tank part of the units.

2.3.16 Large volume water heaters, with a stored water capacity of >15 litres, should be maintained at a temperature of ≥60.0°C allowing for distribution temperatures of ≥50.0°C.

2.3.17 Low volume and Instant water heaters, including combination boilers, should be maintained at a temperature of ≥50.0°C. Usually, these type of water heater units store small water volumes, and because of this they do not always need to be operated within the temperature profile and limits prescribed for larger systems (≥60°C for the ‘flow’ and ≥50°C for the ‘return’ and ‘outlet’) which are necessary for thermal disinfection. These units can, therefore, be operated at “safe” temperatures of ≤41.0°C although they should be switched-on at all times to ensure and encourage adequate use. Infrequent use of these units (less than Daily) would increase the potential of bacterial growth and proliferation (as would be the case in all infrequently used areas throughout the system – both hot and cold), although particularly in this case because of the low temperatures where operated.

2.3.18 Calorifiers shall be subjected to annual inspections.

2.3.19 Calorifiers shall be subjected to annual blow-down and flush via the drain point

2.3.20 Cleaning, flushing and pasteurisation shall be carried out in the event of major modifications or after a period out of service, before a Calorifier is returned to service. Pasteurisation shall also be carried out when the stored water temperature falls below 45.0°C for more than 1 hour before the Calorifier is returned to service.
2.3.21 Return and shunt pumps shall be overhauled on an annual basis (where this is a stated requirement) or shall be serviced and maintained to manufactures specifications.

2.4 **Pressurisation vessels (hot or cold systems)**

Doubts have been expressed about the desirability of using single entry pressurisation/expansion vessels on cold water systems. The use of single entry pressurisation vessels effectively forms a vertical dead-leg through which there is no flow of water and concern has been expressed about the possibility of bacterial growth within the vessel. It is considered preferable therefore, that a pressurisation vessel with both inlet and outlet connections shall be installed, wherever practicable, so that the water content of the vessel is constantly changed. This will also allow for compliance with BS 6144 and BS 6920. Where pressurisation vessels are of the single entry type they must be fitted with appropriate drain valves to facilitate flushing of the unit on at least a Weekly basis. All vessels shall be flushed at least weekly for long enough to ensure adequate replacement of its contents. Care must be taken to avoid damage to the diaphragm.

2.5 **HOT WATER AND COLD WATER DISTRIBUTION SYSTEMS**

2.5.1 The design and installation of the hot and cold water distribution system shall comply with the Water Supply (Water Fittings) Regulations 1999 and BS8558:2015.

2.5.2 The design of the pipework shall ensure that there is no possibility of a cross-connection between installations conveying wholesome water and an installation containing non-wholesome water or water supplied from a private source (untreated). There shall be no possibility of backflow towards the source of supply from any tank, cistern or appliance, whether by back siphonage or otherwise.

2.5.3 All cold distribution pipework, mains and tank down feeds shall be located, as far as is practicable, to minimise heat gains from their environment. Pipework shall not be routed through hot ducts or run adjacent to heat sources, such as radiators.

2.5.4 All pipework shall be insulated, except for any exposed final connections to facilities, and shall be arranged to eliminate or minimise dead-legs.

2.5.5 As far as possible, the objective shall be to design the cold water systems to ensure that the inlet, outlet and surface water temperatures of cold water storage tanks are not greater than 2°C above that measured at the main water meter. Also, at cold water draw-off points, a temperature of not greater than 2°C above the temperature measured in the source Cold water storage tanks shall be reached within one minute.

2.5.6 Stagnation shall be avoided. Hot and cold water services shall be sized to provide sufficient flow at draw-off points. The aim shall be to promote turnover of water by means of; the design of the distribution circuitry, adequate usage and avoidance of disused areas.
2.5.7 Where biological results indicate significant local bacterial contamination and the contaminated outlet cannot be taken out of use for clinical reasons, the contaminated outlet shall be fitted with a suitable Point-of-Use filter to enable continued use of the facility. Where such filters are fitted, they shall be changed according to manufacturer’s instructions.

2.5.8 Where practicable; separate drinking water systems shall be provided directly from the mains without storage, with stored cold water (down service) being used solely for supplies to WCs, wash hand basins, etc. The supply shall not be softened. Additionally, it shall be established that the usage is sufficient to avoid deterioration in water quality, for example, that the inlet water temperature does not exceed 20°C and that the outlet does not remain unused.

2.5.9 The water supply to vending and ice making equipment shall be taken from a mains water supply up stream of a regularly used outlet with the minimum of intervening pipe run i.e. less than 3 metres. The supply shall not be softened. Additionally, it shall be established that the usage is sufficient to avoid deterioration in water quality, for example, that the inlet water temperature does not exceed 20°C and that the outlet does not remain unused.

2.5.10 The equipment shall be positioned so that the warm air exhaust does not impinge directly on taps or hoses supplying cold water.

2.5.11 The domestic hot water system shall not be used for heating purposes. This includes all radiators, towel rails, heated bedpan racks etc., whatever the pipework configuration.

2.5.12 Central “common blending” systems shall not be used, since the length of distribution pipework containing water in the temperature range that supports bacterial growth and proliferation would far exceed the maximum permissible lengths mentioned above.

2.5.13 Cold Water Services (CWS) and Hot Water Services (HWS) direct fed sentinel outlets (outlets nearest and furthest to the water source) shall be measured at monthly intervals. Water temperatures at all outlets, both CWS and HWS, shall be measured at least once annually.

2.5.14 Scalding control in patient areas shall be achieved by the installation of Type 3 D 08 specification TMVs which shall be compliant with: a) The Health Guidance Note “Safe” hot water and surface Temperatures – 1998; and b) The National Health Service Model engineering specifications D 08 Thermostatic mixing valves (Healthcare Premises). The temperature from all such outlets shall be measured on a monthly basis and maintained at:

i. 41°C for showers
ii. 41°C for basins
iii. 43°C for baths
iv. 37°C for bidets
2.5.15 Scalding control in non-patient areas shall be achieved by a combination of TMVs (where the risk of scalding has been assessed and considered to be high) and general “Caution Hot Water” notices in public areas to indicate and warn users of the potential of scalding.

2.5.16 The pipe-work length from the TMV to the outlet shall be restricted to the shortest possible length (ideally less than 300mm and no more than 2 metres)

2.5.17 All TMVs shall be fitted with strainers, isolation valves and non-return valves.

2.5.18 All TMVs shall be accessible (as far as reasonably practicable).

2.5.19 All TMVs fitted to baths, bidets and showers shall be inspected and subjected to a fail-safe test on a six-monthly basis (carried out as described in the manufacturer’s instructions).

2.5.20 All TMVs fitted to facilities in both “high risk and low risk patient areas” shall be subjected to 6 monthly and 12 monthly checks, inspections, overhaul, cleaning and disinfection, including failsafe checks.

2.5.21 Designated drinking water systems and outlets water temperatures shall be measured at regular intervals. Temperatures must be aimed to be maintained within +/- 2°C from incoming mains water temperature. Where the water source is from a bore hole or where the temperatures recorded fall outside the recommended temperature limits, the monitoring must be supported with microbiological analysis for the presence of E.coli and presumptive coliforms.

2.5.22 The Unit Manager shall have the responsibility for identifying all infrequently used outlets within their area and subjecting these to a 2 x WEEKLY flushing program. The process shall be reported via EPUT’s Flushing Process using the current version of EPUT’s Flushing Sheet.

2.5.23 Where infrequently used facilities are deemed by the Unit Manager to be no longer required, they should be notified to the Estates Department for removal. Removal will only be considered if supported by both departmental operational managers and Infection Prevention and Control.

2.5.24 Where a building or sections of the system remain unused for long periods of time, steps shall be taken as follows:

i. Flush all water facilities (including toilet and urinal cisterns) thoroughly 2 x WEEKLY whilst the building is not in use.

ii. If the facilities within a building are to remain unused for a prolonged period (more than one month), then the system shall be drained down, where practicable, (including all vessels) and cleaned and disinfected (any calorifiers are to be pasteurised) prior to being allowed back ‘on-line’. **Note:** The “Area Closure and Opening Process and Dead-leg Flushing pro-forma must be completed. Where this is not practicable, all associated facilities shall be flushed on a 2 x weekly basis.
iii. Consideration shall be given to isolating the unused sections from the system and possibly removing pipe-work and fixtures completely to avoid "dead-legs".

iv. In addition to the flushing regime described above, careful consideration should be given to the usage requirements of the system and any required system changes made accordingly. If it is deemed that the facilities are currently being used seasonally or remain unused for prolonged periods of time, then the following should be considered:

a) Re-engineer the system so that all CWS throughout the system are provided directly off the Mains Cold Water Supply (MCWS). This action will enable the isolation and removal of any cold water storage tanks.

b) As part of the re-engineering of the CWS, it is also recommended that any water storage calorifiers are isolated and removed from the system and replaced with the required number of ‘mains’ fed instantaneous, point-of-use or multipoint water heaters.

c) The absence of water storage vessels will reduce the inherent risk of storing stagnant water although it would not negate the need for flushing the remaining system.

2.5.25 Where a Fire hose-reel is supplied by the Domestic Mains and the line supplying the hose-reels is quite exclusive, distinct and separate from the line supplying domestic facilities, the fire line shall be fitted with a suitable Reduced Pressure Zone (RPZ) valve. Where the fire and domestic supplies share the same line, each hose-reel spur shall be fitted with a double check valve. It is important, however, to ensure that the valves are fitted as close to the domestic line as possible in order to ensure that the dead-leg up-to the valves is EPUT as small as possible.

2.5.26 Although the removal of fire hose-reels and their replacement with local fire extinguishers is the ideal solution, this may not be readily practicable in some cases - where the above alternatives may be suitable.

2.5.27 Where the installation of RPZ or double check valves is not practicable, each unit shall be subjected to a Daily flushing regime in order to minimise stagnation and the potential for increased bacterial proliferation.

2.5.28 Regular checking of the hose-reels, for operational integrity, shall be maintained. This task, however, shall be carried out with due care and attention – ensuring that the creation of aerosols is as low as practicable.

2.5.29 The water in a self-contained eyewash station must be refilled, disposed, and maintained in accordance with manufacturer’s instructions. Emergency showers shall also be flushed daily to clean the line and verify proper operation.
2.6 SHOWERS AND THERMOSTATIC MIXING VALVES (TMV)

2.6.1 All showers (shower-heads and associated hoses) shall be maintained in a good and clean condition and free from excessive scale and dirt deposition.

2.6.2 In all patient areas, all showers shall be fed via Type 3 D 08 specification Thermostatic Mixing Valves (TMV) which shall be maintained and operated at 41°C.

2.6.3 Central “common blending” shower-block systems shall not be used and all pipe-work length from the TMV to the shower-head shall be restricted to the shortest possible length.

2.6.4 Where “common blending” shower-block systems are already in place, each system shall be fitted with a solenoid valve (at the furthest point from the mixer valve), programmed to automatically purge water for a three minute period each day.

2.6.5 All showers shall be subjected to regular temperature monitoring, at least annually.

2.6.6 The temperature monitoring shall be supported with regular microbiological sampling where considered necessary.

2.6.7 All shower-heads shall be inspected at least on a quarterly basis and descaled, cleaned and disinfected. The disinfection process shall include all associated hoses.

2.6.8 Where biological results indicate significant local bacterial contamination and the contaminated outlet cannot be taken out of use for clinical reasons, the contaminated outlet shall be fitted with a suitable Point-of-Use filter to enable continued use of the facility. Where such filters are fitted, they shall be changed according to manufacturer’s instructions.

2.7 BATHS AND TMV

2.7.1 In all patient areas, all baths shall be fed via Type 3 D 08 specification TMVs which shall be maintained and operated at 43°C. Bath fill temperatures of more than 43°C should only be considered in exceptional circumstances where there are particular difficulties in achieving an adequate bathing temperature. If a temperature of more than 43°C is to be used then a safe means of preventing access to the hot water should be devised to protect vulnerable patients.

2.7.2 All temperatures outside the recommended limits must be notified to the Estates Department, as a fault, immediately.

2.7.3 Any injury to the patient during this procedure must be notified to the ward sister immediately using the appropriate incident report pro-formas.
2.8 “WET” AIR HANDLING UNITS (UNITS WHICH INCLUDE CHILLING AND/OR HUMIDIFICATION)

2.8.1 All “Wet” Air Handling Units (AHU) shall be maintained in a good and clean condition and free from excessive corrosion and dirt deposition.

2.8.2 All “Wet” AHU must be designed so that any water/condensate collected is discharged fully, freely and as quickly as possible. This can usually be achieved via a 1:20 fall being provided for runoff.

2.8.3 All associated drip-trays must be designed so that they can be easily accessible for cleaning and disinfection.

2.8.4 All associated drip-trays must be fitted with a suitable drain assembly which is fitted with a suitable glass trap and a Type ‘A’ air-gap prior to connection onto central drainage systems.

2.8.5 All “Wet” AHU shall be subjected to a regular trap cleaning and disinfection.

2.8.6 All “Wet” AHU” shall be subjected to a regular internal components (drip-tray, chiller and heater batteries and humidifiers) cleaning and disinfection.

2.9 OTHER SYSTEMS

2.9.1 All systems shall be maintained in a good and clean condition and free from excessive corrosion and dirt deposition.

2.9.2 All lathes and cutting tools shall be flushed or emptied on a daily basis or used without coolant.

2.9.3 All lathes and cutting tools shall be subjected to a Monthly cleaning and disinfection.

2.9.4 Irrigation systems shall not use untreated water or untreated grey water and water shall not be dispersed using sprays.

2.10 PORTABLE AIR CONDITIONING UNITS:

2.10.1 Portable Air Conditioning Units will only be used on the authorisation of the relevant Associate Director, or the Associate Director of Estates and Facilities

2.10.2 EPUT’s Estates Team does not recommend the use of Portable “wet” evaporative cooling point-of-use units. These units are considered to pose a significant Risk of Legionellosis due to their mode of operation, which includes the wetting of medium and the production of aerosols, which, if not maintained correctly, can increase the potential of bacterial growth and proliferation. The Estates Team shall immediately isolate and remove any such units and advise the infection control team of the service receiver.
2.11 PORTABLE HUMIDIFIERS

2.11.1 Portable humidifiers shall not be used without the written permission of the ward/department manager who would need to ascertain suitability of use following an adequate risk assessment.

2.11.2 All portable humidifiers shall have their reservoir (where applicable), filled using only clinical sterile water.

2.11.3 All portable humidifiers shall have their reservoir (where applicable), emptied on a daily basis.

2.11.4 All humidified incubators shall be cleaned and disinfected, after each use, using appropriated disinfectant solutions as recommended by the manufacturer.

3.0 RISK ASSESSMENTS

3.0.1 A suitable and sufficient Legionella risk assessment shall be carried out in accordance to BS 8580:2010 – Water Quality – Risk assessments for Legionella Control – Code of Practice on all the buildings currently owned or occupied (under a full maintenance lease or otherwise) by EPUT.

3.0.2 The assessments will be reviewed regularly and updated when there are significant changes to statutory standards, operational requirements and when there are significant changes to a building's domestic water or other risk systems.

Systems which are susceptible to colonisation by Legionella, and which incorporate means for creating and disseminating water droplets, will be identified, and the risk they present will be assessed. 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 shall be developed and implemented to reduce the risk to a minimum.

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

3.0.4 The primary purpose of the assessment is to demonstrate that management has identified all the relevant factors, has instituted corrective or preventive action, and is monitoring that the plans are implemented and effective.

3.0.5 A further purpose of the assessment is to enable a valid decision to be made about:

i. the risk to health, i.e. whether the potential for harm to health from exposure is reasonably foreseeable unless adequate precautionary measures are taken;

ii. what control measures are to be implemented to minimise the risk from exposure to Legionella.
3.0.6 The Risk Assessments must include identification and evaluation of potential sources of risk and:

i. the particular means by which exposure to Legionella is to be prevented; or

ii. if prevention is not reasonably practicable, the particular means by which the risk from exposure to Legionella is to be minimised.

3.0.7 The Risk Assessments, Action Logs, Written Schemes and implementation of precautionary measures, shall be carried out by EPUT or Contractor personnel who have had and can demonstrate suitable and appropriate training or shall be commissioned from a suitably qualified and experienced third party.

3.0.8 Where additional resources and guidance are required this will be by the appointment of one or more experts from outside EPUT with clear, written responsibilities and lines of communication.

3.0.9 Where the assessment demonstrates that there is no reasonably foreseeable risk or that risks are insignificant and unlikely to increase, no further assessment or measures are necessary. However, should the situation change, the assessment shall be reviewed and any necessary changes implemented.

3.0.10 The assessment will be reviewed whenever there is reason to believe that the original assessment may no longer be valid. This may be because of:

i. changes to the plant or water or its use;

ii. changes to the use of the building in which it is installed;

iii. the availability of new information about risks or control measures;

iv. the results of checks indicating that the control measures are no longer effective.

v. Changes in personnel assigned responsibility within the Policy Document.

3.0.11 In identifying and assessing the risks in any water system and in drawing up and applying the necessary control measures, notice should be taken of the Health & Safety Executive (HSE) Guidance Notes, appropriate Health Technical Memoranda (HTM) and British Standards described in the Policy Document.

3.0.12 A written scheme of control will be devised based on the results of the Risk Assessments. This must clearly identify who has overall accountability for the premises, and who is responsible for devising and carrying out the procedures.

3.0.13 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.

3.0.14 BS 8580:2010 – Water Quality – Risk assessments for Legionella Control – Code of Practice recommends that the risk assessment should be carried out by independent bodies and shall not take the form of a quotation for any remedial works required. The risk assessment shall not only concentrate on the physical condition of the associated plant and equipment, the “hardware”, but must also assess the risk posed by the management and execution of the controls systems, “software”, in place.

4.0 PREPARATION OF ACTION PLAN

4.1 On completion of the Risk Assessments the Authorised Person and Responsible Person with the assistance of the Legionella Water Quality Group shall commission the following procedure:

4.1.1 Develop schemes for risk minimisation and control in order of priority giving consideration to cost, risk and difficulty.

4.1.2 List all buildings in priority order of non-compliance and potential risk.

4.1.3 Devise a management program for the minimisation of risks so that an action plan identifying resources and timescales is drawn up

4.1.4 Manage the program and identify compliance failures for remedial action.

4.1.5 Review the program of the action plan at 6-Monthly intervals and record progress in implementing the work. All changes to the water systems and functional content shall be recorded and evaluated.

5 MAINTENANCE AND CARE OF WATER SYSTEMS EQUIPMENT

5.1 The plant and equipment used in EPUT’s buildings which have water in the system and can affect the water supply or the atmosphere shall be monitored regularly and be subjected to the following regime:

5.1.1 The systems shall be carefully designed so as to minimise aerosols and the material used in construction would not harbour or provide nutrient for bacteria. They shall be designed to be readily drained and cleaned.

5.1.2 The systems shall be maintained in a clean and sound condition and must be easily and safely accessible.

5.1.3 All plant and distribution pipe-work (where accessible) shall be clearly labelled.

5.1.4 The water quality shall be maintained by ensuring the systems are kept in a good condition by regular cleaning and disinfecting by a regular dosage of water treatment.

5.1.5 Careful monitoring of the precautions.
5.1.6 Records must be kept of the maintenance performed and the results obtained

5.2 RISK MANAGEMENT PROCESSES AND PROCEDURES:

5.2.1 In order to ensure that the devised Risk Management Program is effective in minimising or controlling the risk of Legionellosis, EPUT (or others on its behalf) shall undertake a number of risk management processes including the periodic inspection and monitoring of plant, systems and equipment. These processes shall include:

5.2.1.1 Non Planned Preventative Maintenance PPM Program Control Processes which shall be used when and ‘As Required’

5.2.1.2 PPM Program scheduled tasks to be carried out systematically –

5.3 CALIBRATION:

5.3.1 Temperature measurement equipment and water sampling equipment used by Estates Department staff or by contractors carrying out monitoring works on behalf of the Estates Department shall be calibrated on an annual basis and the certification of calibration appropriately provided and held by the Authorised Person. Calibration service providers shall be accredited via UKAS calibration and accredited to ISO 17025. Records of calibration will be compiled and held on file to enable reference to be made as and when required.

5.3.2 Any temperature measurement equipment used by Ward staff shall be capable of being adequately calibrated, as described above, and held by the Ward Manager.

6 NON PPM PROGRAMME CONTROL PROCESSES

6.1 Systems or individual outlets that are not frequently used allow the development of stagnant water conditions, which increase the potential of bacterial growth and proliferation, including Legionella. In order to remove any stagnation that may have developed or to stop stagnation from occurring in the first place, it is important to introduce a "flushing" program where necessary. Departmental Heads shall have the responsibility to ensure that this requirement is implemented and systematically audited to ensure adequate and correct implementation.

6.2 The flushing program shall be designed so that it allows for the whole dead leg to be removed. This is achieved by ensuring that the flushing is carried out at the specified system or outlet and for an appropriate length of time. The length of time of purging water from the system is important because it is vital to ensure that all the stagnant water has been expelled from the pipe-work and at least until "circulating" or "fresh" water is drawn from the outlet (water at temperatures exhibited throughout the rest of the system).
6.3 The flushing program shall follow the procedure outlined below:

6.3.1 Carry out the “Usage Evaluation” process in order to identify areas/outlets which are not used at least twice-weekly so that they can be flushed.

6.3.2 Ensure that the system/outlet can be flushed safely and in a tidy manner into an appropriate drain if not plumbed for drainage.

6.3.3 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.

6.3.4 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.

6.3.5 Purge the hot and the cold or the mixed water in turn for a minimum of 2 minutes or for a period of time necessary to draw water from the outlet at temperatures exhibited throughout the rest of the system.

6.3.6 If a system or an area consisting of multiple outlets requires flushing, it is important to begin with the nearest outlet to the main distribution pipe-work, working progressively away from the main distribution pipe-work.

6.3.7 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. Where the head is fixed, exposure to the aerosol produced must be minimised. One method that can be employed in this situation is the use of a transparent plastic bag, fixed around the shower-head, with one corner pierced to allow partial discharge of water.

6.3.8 Consider whether the system/outlet can be removed negating further flushing.

6.3.9 Report the process via EPUT’s Log-book system.

7.0 RECORD KEEPING – DATA COLLECTION AND MANAGEMENT

7.1 Details of operational and functional tasks shall be drawn up for the site by the Responsible Person Water and Deputy Responsible Person Water. These, together with the completion of the Log-Books, will enable a proper historical record to be compiled of all works carried out and observations made. The detailed information required in the Log-Book shall depend on the type and complexity of the system or water service to which it applies.

7.2 Precautionary measures and treatments, monitoring results and remedial work shall be logged electronically signed by the person who has carried out the work. Sufficient information shall be recorded to show what measures have been taken and how they have been monitored.
7.3 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.

7.4 The process shall:

7.4.1 Identify the installation requiring attention and how it operates.

7.4.2 Record results of the initial commissioning (if available) and any re-commissioning so that observations made during maintenance checks can be compared.

7.4.3 Define the maintenance task or observation required and the frequency.

7.4.4 Provide for the electronic recording of maintenance observations and results and for comments to be made in respect of any defect seen during the inspection. This facility shall exist for each item of plant individually and for overall system observations.

7.4.5 Provide preliminary guidance on fault diagnosis and checking to assist with immediate on-site correction or adjustment.

7.4.6 Provide for the recording of extensive or abnormal observations which cannot be noted on the routine inspection environments.

7.4.7 Provide dates and results of inspections, tests and all associated works and procedures.

7.4.8 Provide dates for next scheduled inspection, test and associated works visits.

7.5 These entries shall bear the signature of the person carrying out the task and shall be backed-up and EPUT available for inspection for at least five years from completion.

7.6 The user's/occupant's needs shall 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.

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8.0 ON-GOING COMPLIANCE PERFORMANCE MONITORING AND AUDIT

8.1 The Authorised Person shall have Overall Responsibility for Auditing the Legionellosis Management & Control Programs across EPUT, and reporting all findings to the Legionella Steering Committee.

8.2 Shall carry-out, via a suitable qualified Independent Consultancy Firm, a detailed Quarterly audit to assess the compliance of the Legionellosis Management & Control and Safe Hot Water Management Program implemented in buildings
under their control with ACoP L8 and all relevant HTMs and in particular the status of the Risk Assessment Schedules, the Management Structures and Control procedures.

8.3 Shall receive from each site Responsible Person a Quarterly Status Report describing the status of the Legionellosis Management & Control Program, under their jurisdiction.

| 9.0 THE COURSE OF ACTION IF AN OUTBREAK OF LEGIONNAIRES’ DISEASE IS SUSPECTED AND MAJOR OUTBREAK PLAN |
| 9.1 EPUT Estates Staff will usually be informed of a suspected outbreak of Legionnaires Disease by a member of EPUT Infection Control Committee. If an outbreak is suspected, then this Committee will normally work in association with the Public Health Laboratory and the local Medical Officer for Environmental Health to search for the source of the causative organism. This search is a specialist task which involves epidemiological studies and taking water samples for analysis.

9.2 The Health and Safety Executive may be involved in the investigation of outbreaks under the Health and Safety at Work Act 1974. Local authority environmental health officers may also be involved.

9.3 It is essential that EPUT engineers do not drain or disinfect the systems before samples have been taken. The Engineers role is an important one - guiding specialists to the various water systems within the building, and, in particular, to the points from which samples can be taken. Easy access to these sampling points is essential.

9.4 An investigation would concentrate upon all potential sources of Legionella infection including:

9.4.1 the domestic hot and cold water system distribution;

9.4.2 showers or spray washing equipment;

9.4.3 drainage systems and taps;

9.4.4 whirlpool baths or therapy pools;

9.4.5 humidifiers in ventilation systems;

9.4.6 cooling coils in air conditioning systems;

9.4.7 fountains and sprinklers.

9.5 To assist in such investigations EPUT engineers will need to be able to provide details of all associated equipment, its location, technical data, the operating, and maintenance and spares information on all the above installations. They must assist by advising the investigating team as to the extent of servicing on the site and locating taps and sample points.
9.6 Off-site information will also be required such as whether there has been any local excavation or earth moving works; alterations to water supply systems or drainage systems or any other factors which may have a bearing on the site.

9.7 The Infection Control Committee is responsible for identifying the cause of infection and will advise on cleaning, disinfection, any engineering modifications and long-term control measures.

### 10.0 MAJOR OUTBREAK PLAN (Legionella)

10.1 Please refer to the ‘Guidance on the Control and Prevention of Legionnaires’ Disease in England Technical Paper 1 - Disease Surveillance Date of Issue: August 2010 Document code: LegDisTP1 Version: 01.00

10.2 **INTRODUCTION**

10.2.1 This plan is largely based on the general EPUT Outbreak Control Plan, with a few minor alterations to emphasise issues particularly pertinent to the control of legionella.

10.2.2 Legionella species occur naturally in the environment and are particularly associated with water sources. Outbreaks of human disease can be associated with a particular water source, which on occasions has proved to be a health care establishment.

10.2.3 This plan is limited to the actions that should be taken if the source of the outbreak is thought to be one of the systems within EPUT.

10.3 **DEFINITION OF AN OUTBREAK**

10.3.1 “A legionella outbreak is defined by the Health Protection Agency (formerly the Public Health Laboratory Service) as two or more confirmed cases of Legionellosis occurring in the same locality within a six month period. Location is defined in terms of the geographical proximity of the cases and requires a degree of judgement. It is the responsibility of the Proper Officer for the declaration of an outbreak. The Proper Officer is appointed by the local authority under public health legislation and is usually a Consultant in Communicable Disease Control (CCDC).”

10.4 **DETECTION OF AN OUTBREAK**

10.4.1 An outbreak may be detected by a variety of routes and personnel. Clinical, Infection Control, Microbiology and Public Health staff should always consider the possibility of an outbreak when dealing with any case of definite or suspected legionella infection.

10.4.2 Any person, whatever their profession, should contact the local Infection Control Team immediately, if they suspect that an outbreak of legionella infection may be occurring within EPUT. A member of the Infection Control Team is available 24 hours a day and can be contacted via the hospital switchboard.
10.4.3 The Infection Control Team will investigate the situation and the Infection Control Doctor responsible for the site(s) affected will decide whether to instigate the ‘Outbreak Control Plan – Legionella’

10.4.4 Discussions with the relevant members of the Legionella and Water Quality Steering Group will form part of this early fact finding activity.

10.4.5 It shall be noted that when determining whether an outbreak of legionella infection is occurring, cases may not be confined to patients but may also occur in visitors and staff.

10.5 OUTBREAK CONTROL PLAN

10.5.1 The main objectives of the Outbreak Control Plan are as follows:

i. To identify and define at the earliest stage if a legionella outbreak has occurred and if this is associated with EPUT premises.

ii. To organise satisfactory communication with appropriate internal and external agencies, patients and relatives.

iii. To identify the source of the infection.

iv. To stop further spread and prevent its recurrence.

10.5.2 The responsibility for coordinating the above objectives lies with the ‘Outbreak Control Team- Legionella’

10.6 OUTBREAK CONTROL TEAM – LEGIONELLA

10.6.1 EPUT is a large organisation with many different sites. A legionella outbreak may affect one or more sites. The relevant personnel for each site affected should be included in the Outbreak Control Team. Some of the roles detailed below will be filled by the same person e.g. the Infection Control Doctor may also be the microbiologist on the Legionella and Water Quality Steering Group.

10.6.2 The Outbreak Control Team must be called together rapidly and will comprise:

i. Infection Control Doctor(s) – responsible for the site(s) affected

ii. Consultant Microbiologist(s) - responsible for the diagnostic microbiology

iii. laboratory service for the site(s) affected

iv. Infection Control Nurse(s) - responsible for the site(s) affected

v. Legionella Steering Group members

vi. Director of Infection Prevention and Control or nominated deputy

vii. Medical Director

viii. Nursing Director

ix. Medical, Nursing and Managerial staff from the site(s) affected

x. CCDC

xi. Occupational Health Doctor/Nurse

xii. Responsible Person
10.6.3 Additional members may be invited to attend the outbreak meeting and may include:
   i. Senior Bed Manager
   ii. Medical records manager
   iii. Nominations from the Communicable Disease Surveillance Centre or the Division of Hospital Infection, Central Health Protection Agency Laboratory
   iv. Consultant from the local Health Protection Agency Laboratory
   v. Regional Epidemiologist
   vi. Public Relations Officer

10.6.4 Secretarial and clerical support must be made available to the Team and regular reports distributed to all Team members.

### 11.0 PROCEDURE FOR OUTBREAK CONTROL TEAM MEETINGS

The first Outbreak Control Team meeting will be coordinated by the Infection Control Doctor for the site(s) affected.

11.1 The terms of reference of the Team are:

11.1.1 To investigate the source and cause of the outbreak

11.1.2 To implement measures necessary to control the outbreak

11.1.3 To monitor the effectiveness of the control measures

11.1.4 To provide clear guidelines for communication with patients, patients’ relatives, media, staff, other health authority services within and outside the Hospital.

11.2 Particular topics that should be considered by the Team are:

11.2.1 Detection of the source and implementation of any remedial measures required

11.2.2 Case definition and detection of cases

11.2.3 Diagnostic procedures and the effect on the microbiology laboratory

11.2.4 Treatment of cases and any change in local empirical prescribing policy

11.2.5 Effect on the normal running of the hospital

11.2.6 Managing communication with patients, staff, public and the media

11.2.7 Funding of the above activities
11.2.8 Defining the end of the outbreak

11.2.9 Future monitoring and control measures

11.3 The Head of Infection Prevention and Control – will initially act as chairperson and outbreak coordinator. The Team should decide at the first meeting the roles to be undertaken by each Team member.

11.4 Each member shall keep a daily record of his or her actions in respect of the outbreak and retain them in case the handling of the outbreak is reviewed/challenged at a later date.

11.5 It shall be noted that the Estates Services Team plays a pivotal role in the detection of the source of the outbreak and implementing any remedial measures.

11.6 Subsequent meetings will systematically review the outbreak. The need to obtain further assistance should be formally considered at each meeting. It shall be recognised that regional and national expert support is available for Legionella outbreaks and the Team shall make best use of this.

### 12.0 AT THE END OF THE OUTBREAK

12.1 After the outbreak is officially considered over, a final meeting of the Outbreak Team should be held to:

12.1.1 Review the action taken by all participants and to identify any areas for further improvements.

12.1.2 Recommend if necessary changes which will reduce the chance of recurrence of the outbreak.

### 13.0 INTERIM AND FINAL REPORTS

13.1 The Outbreak Control Team is responsible for providing any interim reports required by the hospital, and the final report at the conclusion of the outbreak, which must be signed by:

13.1.1 Infection Control Doctor – responsible for the site(s) affected

13.1.2 Responsible Person

13.1.3 CCDC

13.1.4 Director of Infection Prevention and Control or nominated Deputy

END