Is my heated water system captured under the Legionella Regulations?

Due to the age, design and modification of some heated water systems, it can be difficult to determine if certain systems are captured under the Public and Environmental Health (Legionella) Regulations 2008 (the Regulations).

This fact sheet has been developed to assist you in determining if your heated water system is captured under the Regulations. It should be read in conjunction with the Regulations and SA Health's *Guidelines for the Control of Legionella in Manufactured Water Systems*.

Warm water systems – why are they a risk?

Warm water systems are typically found in care facilities, such as nursing homes, hospitals and child care centres, where water for purposes such as bathing and cleaning is provided at approximately 45^{o}C to prevent scalding.

Warm water provides ideal temperatures for the growth of *Legionella* bacteria, the causative agent of Legionellosis or Legionnaires' disease. When water containing *Legionella* is aerosolised through processes such as showering, there is a risk that it can be inhaled and Legionellosis can result. The risk from *Legionella* can be managed through the proper design, installation, operation and maintenance of heated water systems.

To ensure that high risk manufactured water systems (including warm water systems) are designed, operated and maintained in a manner that reduces the risk of *Legionella* growth, the Department of Health introduced the Regulations and *Guidelines for the Control Legionella in Manufactured Water Systems* (the Guidelines).

What kinds of systems deliver warm water?

There are two main system designs that result in the automatic delivery of warm water:

- Those that distribute or recirculate warm water throughout the system by means of a temperature controlling device located close to the hot water storage tank or water heating device. These are often referred to as tepid or tempered warm water systems.
- Those that deliver hot water to automatic temperature controlling devices, such as thermostatic mixing valves (TMVs), where it is cooled to the desired temperature by mixing with cold water, prior to delivery at the outlet(s). These devices are usually located close to the outlets (ideally within 1-6 metres).

All systems that deliver warm water are capable of growing Legionella, and may potentially cause Legionnaires' disease.

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Which systems are captured by the new Regulations?

The Public and Environmental Health (Legionella) Regulations 2008 define a warm water system as:

'a reticulated water system that distributes or recirculates warm water through the majority of its branches at a nominal temperature of 45°C by means of a temperature controlling device.'

Such systems are captured by the Regulations except where they are located within:

(a) a Class 1A (a detached house or one or more attached dwellings), 4 (a dwelling in a building that is Class 5, 6, 7, 8 or 9 if it is the only dwelling in the building) or 10 (a non-habitable building or structure) building under the *Building Code*, or

(b) a sole-occupancy unit in a Class 2 (flats or apartments) building under the *Building Code*,

provided that it is not a warm water system that serves more than one dwelling.

Tepid warm water systems

Tepid warm water systems distribute or recirculate warm water at temperatures conducive to the growth of *Legionella* (nominally 45^{o}C).

These systems often incorporate a temperature controlling device or devices, such as tempering valves or thermostatic mixing valves (TMVs), which temper a hot water supply with cold water to provide warm water to outlet fixtures. In tepid water systems that utilise temperature controlling devices, the mixing of hot and cold water generally occurs in close proximity to the hot water source or hot water storage unit, and warm water is then distributed or recirculated throughout the majority of the system. Such devices may also be located at the start of extensive water distribution systems.

If colonised with *Legionella,* these types of systems usually present a health risk to a greater number of people than systems which mix hot and cold water through temperature controlling devices located close to the outlets.

Tepid warm water systems are depicted in Figures 3 and 4 of Schedule 1 of the Guidelines.

All tepid warm water systems are captured by the Regulations.

What about heated water systems incorporating TMVs?

TMVs may be contained in both:

- warm water systems (which are captured by the Regulations), and
- hot water systems (which are not captured by the Regulations).

Hot water systems Incorporating TMVs

A hot water system is defined by the Guidelines as:

'a reticulated water system that distributes or recirculates hot water through the majority of its branches primarily at or near a temperature of 60^{o}C. A hot water system may include temperature control devices' (such as TMVs).

The *Legionella* risk associated with such systems may be reduced if the TMV(s) is/are located in close proximity to the outlet(s) which they serve, resulting in the presence of hot water through larger sections of the mains. To minimise water stagnation, heat loss and the growth of micro-organisms including *Legionella*, it is recommended that the length of pipe work from a TMV to each of its outlets does not exceed six metres. However, these systems are not risk free, and *Legionella* bacteria is commonly isolated from such systems.

Hot water systems are depicted in Figures 1 and 2 of Schedule 1 of the Guidelines.

Hot water systems are not captured by the Regulations

Hybrid systems

Depending on the age, modification, and configuration of your system, and the number and location of temperature controlling devices it incorporates, it may be difficult to determine if it is defined as a hot water system or a warm water system under the Regulations.

Some systems, originally designed as hot water systems, may have been extensively modified, resulting in the system no longer bearing any resemblance to its original design. Such a system can be described as a hybrid system. Hybrid systems are often complex in their design and lack accurate plans.

The modification of hot water systems will not necessarily result in the system automatically being deemed to be a warm water system. Plans for modifications should be assessed to ensure that the regulated status of the system is unchanged.

Hybrid systems need careful assessment to determine if they are captured by the Regulations.

It is important to note that all systems that deliver warm water are capable of growing *Legionella* and may potentially cause Legionnaires' disease.

I need help in assessing my system and determining if it is a regulated warm water system

In order for your system to be accurately assessed to determine if it is captured by the Regulations, you will need plans or a scale sketch of the system. Plans should identify:

- the location of the water heater(s) and/or hot water storage unit(s)
- all temperature controlling devices (TMVs or tempering valves)
- the temperature of the water (hot, cold or warm)
- the direction of flow of the water

Some facilities, premises or institutions may have multiple discreet systems. Each separate system should be assessed as an individual entity.

Changes to a heated water system, such as relocation of valves or the addition of new pipe work, may change the regulated status of the system. The system must be re-assessed when any such modifications are made.

Where a system does not meet the definition of a warm water system, and pipe lengths from TMVs to each outlet do not exceed six metres (nominally), such a system will be deemed to be a hot water system (not captured by the Regulations).

Where every effort has been made to maximise the extent of the system containing hot water, through the use of TMVs (ideally located within 1-6 metres of the outlets), such a system will be deemed to be a hot water system.

In the first instance, your plans should be assessed by your local council's environmental health officer.

If you are unable to reach agreement on the regulated status of your system, you may contact the Department of Health for further advice.

My system is captured by the definition, what must I do?

- You must register each regulated warm water system on your premises with your local council.
- Plans of the system must be kept on the premises in a readily available place, and be made available for inspection on request by an authorised officer by 1 October 2009.
- Operating and maintenance manuals for the system that comply with clause 2.6.1 of AS/NZS

3666.2 must be kept on the premises in a readily accessible place, and made available for inspection on request by an authorised officer.

- Your system must be operated and maintained by a competent person as defined in the Regulations.
- Water in storage areas of the system must be kept at a temperature of at least 60°C at all times while the system is in operation.
- The temperature of water in storage areas and throughout the system must be measured at least once every month and recorded in the maintenance log book.
- The system must be physically inspected at least once every month to examine the cleanliness and mechanical condition of the system, and the system must be thoroughly cleaned when impurities or foreign material are found to be present in the system.
- The system must be decontaminated at least every six months as specified in section 13 of the Regulations. This does not apply to systems that have mixing valves located in close proximity to the outlets which they serve, and the length of pipe between valves and each of their respective outlets does not exceed six metres).
- Maintenance log books must be kept as specified in section 14 of the Regulations.

Systems that utilise TMVs

These systems are not without risk, and the owners of such systems (whether or not they are captured by the Regulations) should conduct and record the following maintenance activities, to minimise the risk to health of staff, patients, customers and visitors.

- All valves must be accessible for service and maintenance.
- At least once each week, all warm water outlets not used in the previous seven days should be flushed until the correct operating temperature is reached at the outlet.
- Pipe length from a TMV to each of its respective outlets should not exceed six metres.
- Mixing valves should be regularly serviced in accordance with manufacturer's instructions and AS4032.3 (at least once every 12 months).
- Mixing valves should be disinfected (using chlorine or by pasteurisation) after servicing and before being returned to service.
- Dead legs in the system should be identified and eliminated.

All TMV systems present a risk to health, and appropriate maintenance and record keeping is essential to minimise the risk.

Where to find more information

Your Local Council

Your Local Council is the key local contact for registration and general advice about *Legionella* and compliance with the *Public and Environmental Health (Legionella) Regulations 2008*.

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Website: www.health.sa.gov.au/pehs, click on 'Environmental Health'

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