Fact Sheet

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 they are captured under the South Australian Public Health (Legionella) Regulations 2013 (the Legionella Regulations).

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

Warm water systems – why are they a risk?

Warm water systems are typically found in care facilities, such as nursing homes, hospitals and childcare centres, where warm water for purposes such as showering, bathing and hand washing is provided at approximately 45°C to prevent scalding.

Warm water provides the ideal temperature for the growth of *Legionella* bacteria, the causative agent of legionellosis (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* colonisation and growth, SA Health introduced the Legionella Regulations and the Legionella Guidelines.

What kinds of systems deliver warm water?

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

- Systems that distribute or recirculate warm water throughout the majority of the system by means of a temperature controlling device or devices, usually located close to the hot water storage tank or water heating device(s). These are often referred to as tepid or tempered warm water systems.
- Systems that deliver hot water ≥60°C 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). The mixing valves are located close to the outlets (ideally maximum six metres of pipe from valve to outlet).

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 Legionella Regulations?

The Legionella Regulations 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.'

These systems are captured by the Legionella Regulations except if located within:

a) a Class 1A, 4 or 10 building (private single domestic dwelling) under the Building Code, or
b) a sole occupancy unit in a class 2 building (unit or flat) 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 through the majority of the system at temperatures conducive to the growth of *Legionella* (nominally 45°C).

These systems may incorporate a temperature controlling device or devices, such as tempering valves or TMVs, which temper a hot water supply with cold water to provide warm water to outlet fixtures. In tepid warm water systems that utilise mixing valves, the mixing of hot and cold water generally occurs near the hot water source or hot water storage unit, and warm water is then distributed or recirculated throughout the majority of the system.

Some tepid warm water systems use heat exchangers to heat the incoming and recirculating water to a pre-set nominal temperature of 45°C.

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 using temperature controlling devices located close to the outlets.

Tepid warm water systems are depicted in Figures 5 and 6 of Schedule 1 of the Legionella Guidelines.

All tepid warm water systems are captured by the Legionella Regulations.

What about heated water systems incorporating TMVs?

TMVs may be contained in both:

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

Hot water systems incorporating TMVs

A hot water system is defined by the Legionella 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°C. A hot water system may include temperature control devices (such as TMVs) to regulate temperature near outlets'.

The *Legionella* risk associated with hot water systems incorporating TMVs may be reduced if the TMVs are in close proximity to the outlet(s) they serve, resulting in the presence of hot water ≥60°C through the majority of the system.

To minimise water stagnation, heat loss and the growth of microorganisms, including *Legionella*, it is recommended that the length of pipe work from a TMV to each of its outlets does not exceed six metres. These systems are not risk free, and *Legionella* bacteria is commonly isolated from such systems.

Hot water systems are depicted in Figures 3 and 4 of Schedule 1 of the Legionella Guidelines.

Hot water systems with TMVs located ≤6m from outlets are not captured by the Legionella Regulations.

Hybrid systems

Depending on the age, modification, and configuration of a system, and the number and location of temperature controlling devices it contains, it may be difficult to determine if it is defined as a hot water system or a warm water system under the Legionella 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 commonly lack accurate plans.

The modification of a hot water system will not necessarily result in the system automatically being deemed to be a warm water system and vice versa. Plans for modifications should be assessed by the relevant authority to determine whether the regulated status of the system will change.

Hybrid systems must be thoroughly assessed to determine whether they are captured by the Legionella Regulations.

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

I need help in assessing my system to determine 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 Legionella Regulations, you must provide plans or a scale sketch of the system that 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).
- plans of pipework indicating the direction of flow of the water.

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

Changes to a heated water system, such as the 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.

If a small mixing valve system technically meets the definition of a warm water system, but the pipe lengths from each mixing valve to all outlets do not exceed six metres (e.g., it is equivalent to the warm sections of a well-designed hot / TMV system), the system may be deemed to be a hot water system by the relevant authority (hence not captured by the Legionella Regulations).

If there is any uncertainty about the regulated status of a system, the plans should be assessed by an environmental health officer from the relevant authority (usually the local council).

If you are unable to reach a conclusion on the regulated status of a system, you may contact SA Health for further advice.

My system is captured by the definition, what are the requirements?

You must register the system with the relevant authority.

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

Operating and maintenance manuals 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.

The system must be operated and maintained by a competent person as defined in the Legionella 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 logbook.

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 once every six months as specified in regulation 13 of the Legionella Regulations.

Maintenance logbooks must be kept as specified in regulation 14 of the Legionella Regulations.

The system must be immediately shutdown or decontaminated if *Legionella* is detected in a water sample.

Management and maintenance of systems that utilise TMVs

Regardless of whether they are captured by the Legionella Regulations, systems that utilise TMVs are not without risk. To minimise the risk to staff, patients, customers and visitors' system owners should conduct and record maintenance activities and ensure that:

- all TMVs are accessible for service, maintenance, repair and replacement.
- at least once each week, all warm water outlets not used in the previous seven days are flushed until the correct operating temperature is reached at the outlet.
- pipe length from a TMV to each of its respective outlets does not exceed six metres.
- TMVs should be regularly serviced in accordance with manufacturer's instructions and AS4032.3 (at least once every 12 months).
- TMVs and all pipework downstream of TMVs are decontaminated (using chlorine or by pasteurisation) after servicing and before being returned to service (Refer to Part 2 of Schedule 3 of the Legionella Guidelines for decontamination instructions).
- Dead legs in the system are identified and eliminated.

All TMV systems may allow Legionella growth, presenting a risk to health, and appropriate maintenance and record keeping is essential to minimise the risk. This is particularly important in high-risk facilities such as residential aged care facilities and hospitals.

For more information

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