

National Legionella Conference

Gold Coast 2016

Introduction:

I have over 50 years experience in the plumbing industry. A licenced Plumber and Licenced QBCC Hydraulic Services Designer now operating as HHDC for almost 20 years. Prior to commencing HHDC I was employed by Rheem Australia Pty Ltd for 10 years as a Technical Manager for Queensland; a position that involved sizing and design of solar, gas and electric water heating systems.

I have over the years been responsible for such projects as Royal Brisbane Hospital Redevelopment and Townsville Hospital Projects, also Nambour Hospital new ward block and refurbishment along with numerous Aged Care/Nursing Home Facilities.

Controlling Legionella:

Most of you would be aware that Legionella is constantly present within our reticulated water supply networks. The levels of Legionella in the water supply is generally considered not be of any great risk to most of us, however, this is where servicing the aged but can be of concern to aged. There have also been instances where ice machines have had high readings of Legionella and as such, gives us good reason to be aware of possible dangers no matter what the plant or system may be.

It is therefore essential that we have “checks and balances” in place to maintain and monitor these systems, and most importantly keep records to show that the systems are in fact being maintained in accordance with the designated program. To this, our Qld State Government with the recent Legislation of the Public Health (Water Risk Management) Amendment Bill 2016 addresses the monitoring and maintenance of such systems.

“The objective of the Bill is to implement measures to improve the management and control of health risks associated with the supply and use of water in hospitals and residential aged care facilities in particular the health risks associated with legionella bacteria.”

With the right “checks and balances” such as the regular testing, maintaining and recording of our water systems we cannot eliminate Legionella bacteria but can control such bacteria to an acceptable level.

How do we manage Legionella?

While Legionella in water heating plants is relatively non-existent due to water heated and stored at 65°C the risk is increased where cold water is introduced to the hot water to provide temperatures of 42°C to 45°C at outlets such as basins, baths and showers.

Generally there are two methods of providing water at 42°C to 45°C to outlets and in each case, water is heated and stored at 65°. One system design has the temperature control (Thermostatic Mixing Valve) at the water heating plant with a pump circulated "Ring Main". (Reference with white board sketch)

The other system has the temperature control (Thermostatic Mixing Valve) at the points of use such as the ensuite. (Reference with white board sketch)

In both systems, the "risk" is where the cold water (which has Legionella bacteria) is introduced to the hot water. Legionella multiply in temperatures between 20°C and 45°C with maximum growth at temperatures between 32°C and 43°C.

It is therefore crucial that both types of systems are tested regularly at these points (Thermostatic Mixing Valves, and fixture outlets) for levels of Legionella bacteria.

It is therefore essential that tempered water systems, whatever the type, must be regularly monitored and kept at the correct operating temperatures at all times.

How do we control Legionella?

Again, by regular monitoring and testing of the systems and ongoing regular maintenance to ensure systems are operating as required is one way we can control Legionella.

Other things that can be incorporated within the design of the system is to avoid long branches (dead legs) from the circulated "Ring Mains" to the Thermostatic Mixing Valves at ensuites. Other "Dead legs" as such can be in the main circulated system where temperatures drop (due to slow pump speeds) and the return leg to the water heater plant could be in the 40°C to 43°C range and possibly increasing the chances of higher counts of Legionella at these points.

Vacant rooms (if these exist!) can also, due to very little or no use at all, have an effect on the system. In such cases these areas should receive more regular testing and maintenance such as flushing the system with water at 65°C possibly on a weekly basis and so on. The system that incorporates a tempering valve at the water heater plant, a by-pass must be installed to allow the whole "Ring Main" and outlets can be flushed. The system that has a tempering valve (Thermostatic Mixing Valves) at ensuites would be controlled

at the Thermostatic Mixing Valve and thus the Thermostatic Mixing Valve would then be reset to 43°C to 45°C accordingly.

It should be noted that if high levels of Legionella are continually detected at outlets or other parts of the system then sanitizing may not always be the solution as there may be other areas of maintenance that need to be addressed or changed.

Other parts of maintenance that are critical are UV lamp replacement and Thermostatic Mixing Valve cartridge changes. Therefore, to control Legionella is a combination of good system design, maintenance of plant and equipment, monitoring and reporting using a good management plan.

In summary, if we can control and manage Legionella, we can live with legionella; not die from Legionella.