



# Legionella Risk Management, Inc.

August 14, 2014

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California Energy Commission  
1516 Ninth Street  
Sacramento, CA 95814-5512

California Energy Commission

**DOCKETED**

**14-AAER-01**

**TN 73589**

**AUG 14 2014**

## **RE: The investor-owned utilities' (IOU's) Tier Proposal – CEC Docket No.14-AAER-1, 2012-2013 Appliance Efficiency Rulemaking Water Appliances**

I have been advocating for years that the those involved in codes and standards impacting building water systems take a holistic approach to the issue. It's a difficult fight. A good example, as an original member of ASHRAE 188 committee developing the first US / International standard on Legionella control we've had issues with other committees in ASHRAE such as service water heating and energy efficiency committees writing guidelines and papers that conflict with our recommendations for Legionella control.

An even better example is when I met with EPA officials responsible for writing the Disinfection Byproducts rule of the Safe Water Drinking Act and informed them of the negative impact the rule would have on buildings wanting to treat potable water with a disinfectant to control Legionella they responded that they hadn't heard of Legionnaires' disease in some time and did not realize it was an ongoing issue, this was in 2003. Hard to believe. (see attached recent article titled "Facilitating supplemental disinfection for Legionella control in plumbing Systems")

A recent well written recent article in Forbes magazine titled, "CDC Errs On Policy As Well As Handling Dangerous Pathogens" discusses in detail numerous serious errors CDC has made with regard to Legionella policy.

Fortunately people are beginning to recognize the problem. CDC and EPA are acutely aware of the growing issue Legionnaires' disease has become. Some states had over 100% increase in reported cases from 2012 to 2013 many had a 50% increase. There are many reasons suggested for this dramatic increase in cases. When I do seminars to building design engineers on the issue I discuss one root cause, Legionella Enabled Engineering Design.

LEED is a good thing but when codes say to cut off water use by placing a restrictor at the end of the line it is a recipe for disaster. It does the same thing to a plumbing system as placing an orifice in and engines gas line. No one would think of trying to improve a car's gas consumption by cutting off the flow of fuel. Low flow orifices, dramatically reduces the velocity of water through a drop leg and a fixture, dramatically increase water aging in that drop leg, fixture and the entire building water system and when done to a city water system will impact in residential areas water ageing in municipal water piping as well.

Do you know that most hospitals have removed flow restrictors completely from all sinks! Don't take my word for it call some hospitals and ask.

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## Legionella Risk Management, Inc.

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Codes need to be developed to lessen the amount of showers in hospitals they are for the most part dead legs, never used and pose a huge risk. Codes changes are needed to be use completely different calculations on sizing piping in building water systems. Piping design should not be based on amount of sinks and shower but amount of occupants. Smaller pipe sizing needs to be called for in codes and shorter drop legs. The 2015 IECC Commercial code requires a maximum of 64 ounces or 50 feet between the source of hot water and the fixture.

I am speaking at the national ASPE conference next month the title of my program is “Legionella: Codes, Compliance and Impact on Plumbing Community” it will discuss how water saving codes are greatly increasing the likelihood of building water systems being colonized with Legionella and resultant Legionnaires’ disease outbreak. I tell people that LEED is not by definition bad engineering just too often is the result of problems.

I strongly recommend using Water Sense flow regulations and not further reducing flow at the faucet or shower. 1.0 gpm flow at lavatory faucets will greatly increase the risk and resultant amount of Legionnaires’ disease illnesses and fatalities.

Thank you

*Tim Keane*

Consulting Legionella Engineer

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## Comments on CEC Docket No.14-AAER-1 by Tim Keane,

### **Multiple Variables of Concern With Water Conservation Efforts**

#### **City water aging - turnover**

1) chlorine - lower chlorine levels (the city is not going out and flushing hydrants more if anything they are flushing less with budget issues this is a big problems)

2) velocity - lower velocity

3) cold water temperature - higher temperature (not much of a concern underground pipe is well insulated in cool soil)

4) bacteria - slightly higher bacteria levels and bio crud accumulation from increased water aging and lower velocities

#### **Building water aging - turnover**

1) chlorine - lower chlorine levels in building cold water

2) velocity - lower velocity in pipe

3) cold water temperature - slightly to significantly higher cold water temperature based on ambient conditions and cold water aging in pipe with normal insulation in unconditioned spaces exposed to higher heat. slightly increased cold water temperature to significantly increased based on amount of leakage in cross connections from mixing valves, shower valves and electronic faucets. The smaller the total water consumption the greater impact even small piss leaks have.

4) cross leakage across components - big concern as the turnover volume reduces dramatically. A little piss leak across a seal in a shower or mixing valve is not a problem if the turnover rate will greatly exceed the piss (leakage) rate.

#### **Single family homes**

Minor concern in single family homes until system get more complex. When you add mixing valve requirements planned changes from Ron George, ASSE and ASPE for lower temperatures you get more cross connections.

#### **Multifamily apartment buildings, commercial (hotels and offices) institutional (hospitals etc)**

When you add mixing valve requirements now from plumbing codes lower (tepid) hot water temperatures you get more bacteria growing and have more complex components causing bacteria to grow. .

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