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MaP comments on tub spout diverters

Additional submitted attachment is included below.

Maximum Performance

August 16, 2017

Mr. Ryan Nelson
California Energy Commission
Docket Unit, MS-4
1516 Ninth Street
Sacramento, CA 95814-5512

RE: DOCKET NO. 17-AAER-09 TUB SPOUT DIVERTERS

Dear Mr. Nelson and Commission staff,

Maximum Performance (MaP®) testing is an organization focused entirely upon promoting and enhancing water use efficiency in the built environment. MaP evaluates and independently tests various plumbing and other water-using products, reports results of independent plumbing product testing, and formally lists plumbing products on its website for the benefit of the general public, design professionals, government agencies, industry, and others.

The attached comment document is intended to only address issues related to the water savings associated with tub spout diverters.

Thank you for considering these comments. We are available to answer questions regarding the above information.

Regards,

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Analysis of Potential Water Savings Associated With Residential Tub & Shower Diverter Standards - California

BY JOHN KOELLER, P.E., MAXIMUM PERFORMANCE (MAP) TESTING

The recent attention given to tub and shower diverters and the potential for further reductions in California residential water use resulted in a variety of savings estimates that deserve further investigation.

Background

Tub and shower diverters and their efficiency were the subject of much scrutiny back in 2001 and 2002 when the California Energy Commission (CEC) adopted an efficiency standard for these products[1]. As a result of that work, for the past 15 years, the CEC has successfully implemented *"California Title 20 – Section 1605.3. State Standards for Non-Federally-Regulated Appliances; (h)(1) Tub Spout Diverters".* That standard specifies that diverters, when new, not exceed a leakage rate of 0.01 gallons per minute (gpm); after 15,000 cycles of diverting, the maximum leakage rate in the standard is set at 0.05 gpm.

Marketplace

Today, every diverter sold and installed in California meets the CEC leakage requirements for these products. New construction is equipped with CEC-compliant diverters. However, there is no data available on the size of the residential diverter replacement market. Others have determined that the replacement rate of tub spout diverters by themselves is an insignificant fraction of sales compared to that of a combination product that would contain a valve, showerhead, and trim. We believe the manufacturer data shows homeowners and managers will not replace an existing (leaking) diverter unless they are undertaking a complete tub/shower remodel.

Water Savings

Proposals are being considered wherein the CEC standard would be significantly changed; the leakage rates for new and aging diverters (after 15,000 cycles) could be set at zero (commonly referred to as the "zero-zero" proposal). Recent calculations by other organizations of potential water savings attributable to such a "zero-zero" proposal are overstated. This overstatement is the result of faulty assumptions, namely that significant accrued savings could be achieved by the replacement of existing, aging (and leaking) diverters[2] independent of a complete shower/tub remodel.

Older (potentially leaking) diverters are likely to 'remain in place' until such time as the owner makes a complete shower/tub remodel. There are no studies or evidence that indicate the current rate of replacement of the thousands of existing, potentially leaking diverters would accelerate as a result of a reduction in the CEC standard[3]. Even when leaking diverters are replaced, the choice for the owner is only be between a currently CEC-compliant model (at 0.01/0.05) and a compliant "zero-zero" model[4]. Therefore, the only savings that can be attributable to a proposed "zero-zero" standard are those resulting from the 'difference' between that standard and the current CEC standard.

Potential initial savings are correctly calculated as follows:

> (0.01 gpm - 0.00 gpm) x 7.8 min/shower x 2.65 persons per household x 0.69 showers/capita/day x 365 days/yr = 52 gallons saved per year per household

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[1] A process in which I personally participated on behalf of the California Urban Water Conservation Council.

[2] The studies and measurements of aging diverters cited by WaterSense, for example, are not representative of the body of installations as a whole, nor was an assessment made as to the causes of the identified leakage, such as water quality, valve and housing materials degradation, or wear and tear.

[3] Unlike other residential plumbing products (toilets, showerheads, faucet aerators), diverters are not routinely replaced by the homeowner or manager. The labor and materials cost of a diverter replacement vs. the potential water savings usually make it uneconomic. To our knowledge, no authoritative study has been conducted that identifies the cost-effectiveness of a diverter replacement and, as such, it should not be assumed that replacements will even occur in the absence of a major tub/shower remodel. Without reliable data on market share, actual diverter replacement history, and replacement cost-effectiveness, there is no basis for savings greater than that shown.

[4] There are many diverters in the existing CEC database that meet the "zero-zero" threshold. To our knowledge, no data exists that identifies what proportion of today's diverter sales and installations meet that requirement.

Conclusions

- The CEC cannot claim water savings related to an increased rate of replacement of aging and leaking diverters.
- The CEC can only claim savings related to the mathematical difference between “zero-zero” and the current CEC standard.
- The potential water (and energy) savings achieved by a proposed “zero-zero” standard are insufficient to warrant a change to the standard.