

DOCKETED	
Docket Number:	25-BSTD-03
Project Title:	2028 Energy Code Pre-Rulemaking.
TN #:	271993
Document Title:	Frank R Nichols, Sr Comments - Prevention of Unintended Hot-Water Draws from Single-Handle Mixing Faucets
Description:	N/A
Filer:	System
Organization:	Frank R Nichols, Sr
Submitter Role:	Public
Submission Date:	8/14/2026 2:52:39 PM
Docketed Date:	8/14/2026

Comment Received From: Frank R Nichols, Sr
Submitted On: 8/14/2026
Docket Number: 25-BSTD-03

Prevention of Unintended Hot-Water Draws from Single-Handle Mixing Faucets

Additional submitted attachment is included below.

Proposed Energy Efficiency Measure

Prevention of Unintended Hot-Water Draws from Single-Handle Mixing Faucets

Patent-Pending Technology | Submitted for CEC Review

Executive Summary

Single-handle mixing faucets commonly admit both hot and cold water when the handle is opened near its normal center position. During many brief uses - rinsing an item, wetting a cloth, washing hands briefly, or similar tasks - the user neither needs nor waits for heated water to reach the outlet. Nevertheless, hot water is withdrawn from the water-heating system and replaced by cold inlet water, creating an avoidable water-heating load. The submitter has developed a patent-pending mechanical control for a single-handle mixing valve that normally prevents admission of hot water during such brief operation unless the user performs a small deliberate action indicating that hot water is wanted.

1. Energy-Waste Mechanism

The proposed measure addresses an energy loss that can occur even when no heated water is ultimately delivered at the faucet. If a single-handle faucet is opened in a mixed position for only a few seconds, hot water can leave the water heater and enter the hot-water piping. The draw may end before that heated water reaches the faucet. The water heater must then heat replacement inlet water even though the user's task required no hot water.

2. Illustrative Household Calculation

The following is a screening calculation based on direct observation at one two-person residence. It is presented to illustrate the possible order of magnitude, not as a claim that the observed behavior is representative of all California households.

Observed / Assumed Quantity	Value	Result
Total faucet flow during brief draw	100 mL/s	
Approximate hot-water fraction at centered mixed position	50%	50 mL/s hot
Typical brief-use duration	5 s	250 mL hot/event
Observed brief-use events	12/day	3.0 L hot/day
Water-heater temperature	125°F	
Cold inlet-water temperature	60°F	65°F temperature rise
Thermal energy associated with 3 L/day		≈ 454 kJ/day
Equivalent daily energy		≈ 430 BTU/day; 0.126 kWh/day; 0.00430 therm/day
Equivalent annual energy per household		≈ 165 MJ/year; 157,000 BTU/year; 46 kWh/year; 1.57 therm/year

Calculation basis: $3 \text{ kg/day} \times 4.1868 \text{ kJ}/(\text{kg} \cdot ^\circ\text{C}) \times [(125 - 60)^\circ\text{F} \times 5/9] \approx 454 \text{ kJ/day}$.

3. Illustrative Statewide Magnitude

For screening purposes only, assume 10 million California single-family residences and assume that only 30 percent - 3 million residences - have an applicable single-handle faucet exhibiting this type of mixed hot/cold brief-use behavior. Applying the illustrative household value of approximately 46 kWh/year gives:

$$3,000,000 \text{ households} \times 46 \text{ kWh/year} \approx 138 \text{ GWh/year}$$

Equivalent annual thermal energy is approximately 4.71 million therms, 471 billion BTU, or 4.97×10^{14} joules. This screening estimate deliberately excludes multifamily residences, larger households, hospitals, dormitories, schools, military facilities, commercial buildings, and other installations. It also does not attempt to add water-heater conversion or system losses.

4. Proposed Solution

The proposed technology is a mechanical feature incorporated into, or associated with, a single-handle mixing valve. Its normal operating state prevents or substantially limits admission of hot water during ordinary brief faucet operation unless the user performs a small deliberate action indicating that hot water is desired. The intent is to preserve normal single-handle convenience while preventing unintended hot-water withdrawal.

5. Patent Status

U.S. utility patent application pending.

The submitter is the inventor/applicant. The present submission is intended to identify and quantify a potential energy-efficiency measure for CEC consideration; it is not a request that CEC evaluate the patentability or commercial value of the invention.

6. Available Validation Plan

A formal field-test plan has been developed to measure hot- and cold-water volumes dynamically during each faucet activation, together with activation duration and relevant water temperatures. The resulting data would permit identification of brief draws in which hot water is admitted to the supply piping but is not required for the user's task, and would permit calculation of the associated avoidable water-heating energy.

Before commissioning a potentially lengthy and costly independent field study, however, the submitter seeks CEC guidance regarding the level and type of validation needed for CEC to evaluate this measure. Existing CEC or utility data, engineering analysis, CASE analysis, CEC-contractor work, or CEC-directed testing may be capable of resolving some or all of the relevant questions without requiring a separately commissioned study.

7. Request to the California Energy Commission

The submitter respectfully requests that CEC staff review this proposed measure to determine whether prevention of unintended hot-water draws from single-handle mixing faucets merits further evaluation for inclusion in the Building Energy Efficiency Standards. The submitter further requests guidance regarding the technical evidence CEC would require to quantify statewide energy savings, and whether such evaluation could be performed by CEC staff, a CASE team, a CEC contractor, or another CEC-directed program rather than requiring the submitter to independently commission field testing.

8. Submitter Contact Information

Name: Frank R Nichols, Sr.

Organization (if applicable): (n/a)

Email: frankrnichols@yahoo.com

Telephone: 760-822-6303

Patent application: 19/213,171 filed 05/20/2025

Note: Numerical values above are preliminary screening estimates intended to demonstrate potential order of magnitude and to request CEC technical evaluation. They are not presented as results of a representative statewide field study.