NRDC Recommendations for Appliance Standards Development for Water-Using Products

CEC Efficiency Committee Workshop

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NRDC

THE EARTH'S BEST DEFENSE

Saving Water and Energy with New or Revised Standards

- Toilets
- Urinals
- Lavatory faucets
- Faucet aerators
- Commercial dishwashers
- Water meters
- Sprinkler heads

Estimated Water and Energy Savings Statewide: 2014 - 2030

Product	Water Savings (MGD)	Energy Savings (GWh/year)
Toilets [1]	58.8	--[2]
Urinals [3]	18.3	--[2]
Lavatory Faucets & Faucet Aerator [4]	7.1	37.5
Commercial Dishwashers [5]	2.5	82.0
Water Meters [6]	219.8	--[2]

1 Estimation of savings in single family residential toilets only. Assumes change from 1.6 gpf to 1.28 gpf effective January 2014.

2 Energy savings is the embedded energy costs of potable water delivery and wastewater treatment.

3 Assumes standard changes from 1.0 gpf to 0.5 gpf in January 2014.

4 Assumes max flow rate changes to 1.5 gpm at 60 psi effective January 2014 resulting in incremental savings of 0.2 gpcd. Also, assumes 11.5% CA homes use electricity to heat water, 70% residential faucet use is hot water, and 0.18 KWh is required to heat one gallon of water to 120°F.

5 Assumes stock turnover by 2030, average annual savings per product: water - 14,102 gal; energy - 1,292 kWh.

6 Assumes more accurate meters would allow customers to identify and fix approximately 10% of previously undetected leaks. Applied to single family housing units. Assumes existing single family meters replaced with 5/8" and new construction installed with 3/4".

Plumbing Fixtures

Proposal →

Product	Current Standard	Proposed Standard
Toilets	1.6 gallons per flush (gpf)	1.28 gpf
Urinals	1.0 gpf	0.5 gpf

New standards have already been established by statute in AB 715 (2007) regarding covered types of toilets and urinals, to take full effect January 1, 2014.

Recommendations --revise the current standards in Title 20 regulations to conform with legislatively enacted standards.

- Standards --
  - Revise Table I ("Eye") in 1605.1(i) to conform with AB 715 performance standards with an effective date of January 1, 2014
    - ✓ Toilets – 1.28 gallons per flush
    - ✓ Urinals – 0.5 gallons per flush
  - Correct the omission of flushometer valve toilets (other than blowout toilets) from Table I.
- Test Methods --
  - Revise 1604(i) to incorporate ASME A112.19.2 and A112.19.14 (as specified in AB 715), to cover dual-flush toilets.

Plumbing Fittings

Proposal →

Product	Current Standard	Proposed Standard
Lavatory Faucet	2.2 gpm @ 60 psi	1.5 gpm @ 60 psi

Faucets account for more than 15 percent of indoor household water use—more than 1 trillion gallons of water across the United States each year.

Recommendations --

- Revise Table H-1 in 1605.1(h)(1) to set the maximum flow rate for lavatory faucets and lavatory replacement aerators at 1.5 gpm at 60 psi, effective January 1, 2014.
- Expand the definition of lavatory replacement aerator to include all flow restricting accessories, including flow regulators, aerator devices, and laminar devices (as per WaterSense definition).
- Cost effectiveness: there is NO incremental price difference between a product meeting this criteria and other less efficient lavatory faucets and lavatory replacement aerators.

Commercial Dishwashers

Proposal → We recommend considering the EnergyStar version 2 specifications as candidate standards for inclusion in Title 20.

- Commercial dishwashers present a good opportunity to save both energy and water with efficiency improvements.
- Lowering rinse water consumption is a key strategy for saving both energy and water.

Commercial Dishwashers (cont'd)

- Energy Star v.1 criteria came into effect October 2007.
- Performance criteria cover water use and idle energy use.
- Market penetration was at 78% of 2009 shipments.
- ES v.2-Draft 2 released May 2011, with a proposed effective date of May 1, 2012.
- Currently covered by Energy Star –
  - Under Counter
  - Stationary Single Tank Door
  - Single Tank Conveyor
  - Multiple Tank Conveyor
- Proposed to be covered in ES v.2 –
  - Flight Type (not previously covered)
  - Pot, Pan, and Utensil (previously covered as stationary single tank door)

Commercial Dishwashers (cont'd)

- Estimated number of units in California (2009)
  - Under-counter 7,900
  - Door-Type – High Temp 26,300
  - Door-Type – Low Temp 16,500
  - Conveyor- Type 11,900
  - Flight Type 3,300
  - Total 65,900
- Annual sales: 2,000 to 4,500 units per year

Source: Koeller & Hoffman, A Report of Potential Best Management Practices – Commercial Dishwashers, CUWCC, 2010

Commercial Dishwashers (cont)

Proposed Standards

[Energy Star v.2 Candidate Standard Levels]

ENERGY STAR Requirements for Commercial Dishwashers -- Version 2				
Machine Type	**High Temp Efficiency Requirements**		**Low Temp Efficiency Requirements**	
	Tank Heater Idle Energy Rate*	**Water Consumption****	**Tank Heater Idle Energy Rate***	**Water Consumption****
Under Counter	< 0.50 kW	< 0.84 GPR	< 0.50 kW	< 1.19 GPR
Stationary Single Tank Door	< 0.64 kW	< 0.89 GPR	< 0.60 kW	< 1.18 GPR
Pot, Pan, and Utensil	< 0.70 kW	< 0.58 GPSF	< 0.60 kW	< 0.58 GPSF
Single Tank Conveyor	< 1.50 kW	< 0.700 GPR	< 1.50 kW	< 0.790 GPR
Multiple Tank Conveyor	< 2.00 kW	< 0.540 GPR	< 2.00 kW	< 0.540 GPR
Flight Type	TBD	XX GPH	TBD	XX GPH

Commercial Dishwasher (cont)
Proposed Test Methods [Energy Star v.2]

Gallons per Rack (GPR) and Gallons per Square Foot of Rack (GPSF):

- NSF/ANSI 3-2010 Standard, *Commercial Warewashing Equipment;* and
- *ENERGY STAR Test Method for Final Rinse Water Consumption*

Idle Energy Rate – Undercounter and Stationary Rack, Single Tank, Door Type:

- ASTM Standard F1696-07, *Standard Test Method for Energy Performance of Single-Rack Hot Water Sanitizing, Door-Type Commercial Dishwashing Machines**

Idle Energy Rate – Single and Multiple Tank Rack Conveyor Dishwashers

- ASTM Standard F1920-07, *Standard Test Method for Energy Performance of Rack Conveyor, Hot Water Sanitizing, Commercial Dishwashing Machines**

* Although the titles of the ASTM test procedures listed above specifically call out hot water sanitizing machines, the idle energy rate portion is also applicable, and shall be used, for chemical sanitizing machines.

Water Service Meters

Proposal → **All water meters sold in California be required to meet a leak detection test flow accuracy requirement.**

Applicable AWWA Standard	Meter Type	Size	Current AWWA Minimum Test Flow (GPM)	Potential "Leak Detection Test Flow" (GPM)
C700	OP, ND	5/8"	0.25	0.125
		5/8" x 3/4"	0.25	0.125
		3/4"	0.5	0.25
		1”	0.75	0.375
		1 1/2"	1.5	0.75
		2"	2	1
C712	SJ	5/8”	0.25	0.0625
		5/8 x 3/4”	0.25	0.0625
		3/4”	0.5	0.125
		1”	0.75	0.25
		1.5"	0.5	0.5
		2"	0.5	0.5
N/A	Electronic	5/8"	none	0.03
		5/8" x 3/4"	none	0.05
		3/4"	none	0.03
		1"	none	0.11

	Meter Type
OP	Oscillating Piston
ND	Nutating Disc
MJ	Multi-Jet
SJ	Single-Jet
FO	Fluidic Oscillator

Not shown in table: MJ, FO, Turbine, Compound.

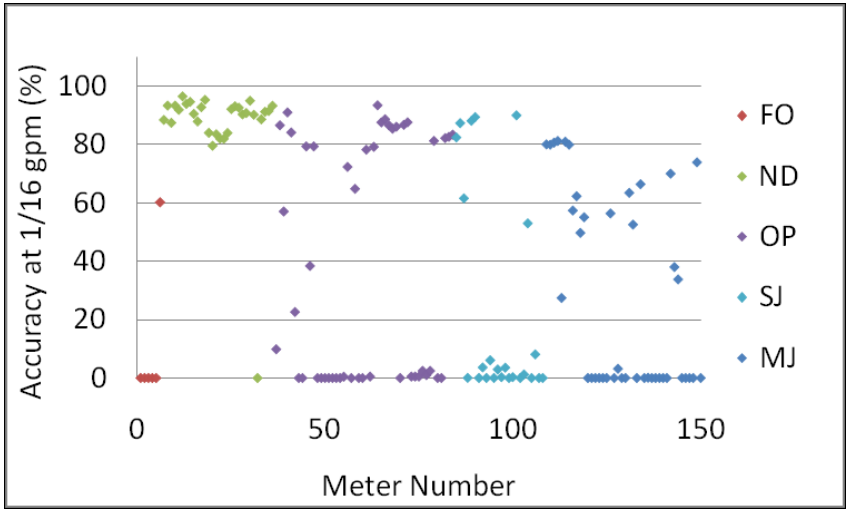
Water Service Meters (cont.)

Improving the Accuracy of Cold Water Meters at Low Flows

- The current minimum test flow and accuracy requirements, set by the American Water Works Association (AWWA) as a voluntary standard, are not adequate.
  - ¾" meters are not required to be tested at flows below 0.5 gpm.
  - A leak at ¼ gpm from one toilet could equal over **131,000 gallons per year** that isn't detected or billed to the customer.

- In California, there are currently about 26 million residential toilets.

- According to WaterWiser.org, 20% of toilets leak
  - At least 13.7% of all indoor water use in single family homes is due to leaking toilets and dripping faucets*. (AWWA, REUS)
    *Only includes flows detected by meters, could be much larger.
  - Customers need a price signal to alert them to potential leaks, and an impact on their water bill to motivate them to fix the leak.



Graph shows the variability of the performance of 5/8"x3/4" meters at 1/16 gallons per minute (gpm)

Landscape Irrigation Equipment

50% of residential water use in California is used outdoors, mostly for landscape irrigation.

- Sec. 25401.9 of the Public Resources Code gives authority to the Commission to adopt performance standards and labeling requirements for landscape irrigation equipment, including irrigation emission devices.
- Rotating sprinkler heads are currently eligible for rebate through the Metropolitan Water District's SoCal Water$mart conservation incentive program. 161 models from 4 manufacturers are currently eligible.
- High efficiency emission devices --
  - Apply water more slowly and uniformly to prevent over-watering and encourage healthy plant growth;
  - Use 20% less water than conventional spray heads.
- Recommendation --
  - NRDC will consult with utility partners to prepare a proposed standard for sprinkler heads for consideration by the Commission.

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