Short Form Work Paper WPSDGENRWH1209

**Revision 0**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Commercial/Residential Flow Control Valves for Faucets and Showerheads**

**May 3, 2019**

# Commercial/Residential Flow Control Valves for Faucets and Showerheads

# Introduction

This short form workpaper documents the values adopted from SCG’s workpaper entitled “Commercial/Residential Flow Control Valves for Faucets and Showerheads” (WPSCGCCWH180504A Revision 0). SDG&E adopts all the values in WPSCGCCWH180504A Revision 0, with the following exceptions:

1. Measure Application Type was adjusted to AOE from REA
2. SDG&E submitted Residential and Commercial NTG ID = “All-Default<2yrs” = 0.7 for all showerhead FCV, kitchen and lavatory faucet FCV Implementations code, given no evaluated NTGR; new technology in program for 2 or fewer years.

Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 05/3/2019 | Keith Valenzuela (AESC) | Created short form workpaper to adopt WPSCGCCWH180504A Revision 0. |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

**Eligibility requirements:**

Residential Faucets and Showerhead Flow Control Valves:

1. This workpaper addresses the savings associated with the installation of flow control valves on bathroom or kitchen sinks for single, multi-family and mobile homes.
2. Mobile home faucet FCV savings are the same as single family home savings. Mobile homes will not have separate defined measures.
3. Measures in this workpaper include a combined/mix water flow rate at the faucet of 1.0 GPM for bathroom sinks and a mix/combine water flow rate of 1.5 GPM at the faucet for kitchen sinks, each measure has single and multifamily option.
4. Flow control valves for faucet water line inlets must be installed in pairs, one in the cold and one in the hot line.
5. Flow control valves for showerhead measures presented in this workpaper for residential applications apply to single-family and multi-family residential households.
6. Residential showerhead flow control valve measure will include (1.0, 1.25, 1.5) GPM.
7. FCV make, model number and flow rate must be included with a copy of the invoice.
8. Flow control valves are applicable to existing faucets without an aerator and a flow rate of 2.2 GPM or greater.

Commercial Faucets and Showerhead Flow Control Valves:

1. The FCV measure for faucets is applicable to existing faucets in commercial buildings that have a flow rate of 2.2 GPM or greater.
2. Measures in this workpaper include a combined/mix water flow rate at the faucet of 1.0 GPM.
3. This workpaper includes only a Direct Install delivery method for flow control valves applied to commercial showerheads. All implementers of this measure will market and identify commercial facilities utilizing higher flow showerheads (>2.5 GPM) and offer to install the retrofit add on FCV (<1.8 GPM).
4. FCV make, model number and flow rate must be included with a copy of the invoice.
5. The commercial showerhead FCV will only be available in 1.5 GPM.

* **Implementation and installation requirements**:

Residential Faucets and Showerhead Flow Control Valves:

1. Flow control valves must have a rated GPM of
   1. 0.50 GPM for bathroom sinks for a combined/mix flow rate of 1.0 GPM.
   2. 0.75 GPM for kitchen sinks for a combined/mix flow rate of 1.5 GPM.

Commercial Faucets and Showerhead Flow Control Valves:

1. The FCV showerhead measures defined in this workpaper are applicable to existing buildings only. Newly constructed buildings, additions to existing buildings, and alterations to existing buildings are excluded.
2. Gas savings from showerhead FCVs will apply to both lodging building types(Hotel/Motel), as well as all other commercial building types. The COM building type designation will include, but is not limited to, educational facilities (University, Public/Private Schools), healthcare facilities, small/large office buildings, fitness centers, and municipal facilities (Recreation centers, parks).
3. Faucet FCVs shall be implemented at private or public lavatory faucets in commercial buildings as a Retrofit Add-on (REA). These building types include, but are not limited to, restaurants, hotels/motels, schools, universities, university campus housing, retail and offices.
4. Private lavatory faucets are defined as those that are found in individual dwelling units such as a hotel/motel guest room, dorm room, or nursing home room. Public lavatory faucets are defined as those found in bathrooms shared by a communal area such as a school, restaurant, hotel lobby, or office building.
5. Faucets at health care facilities that are subject to the Office of Statewide Health Planning and Development (OSHPD) code and regulation (e.g. hospitals, clinics, skilled nursing facilities) are not applicable for this measure.
6. FCVs installed in commercial faucets must be rated at 0.5 GPM for a mix/combined flow rate of 1.00 GPM.

* **Other program restrictions and guidelines**
  1. This measure is applicable to all California climate zones.
  2. Measures in this workpaper only apply to customers who have natural gas service from a California IOU.

## Measure Summary

Table 1: Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **1.1 Measure & Baseline Data** | Please reference WPSCGCCWH180504A Revision 0 Section 1.1 Measure Description & Background.  Base, Standard, and Measure Cases   |  |  | | --- | --- | | **Case** | **Description of Typical Scenario** | | Measure | Fixtures with a flow control valve for a reduce flow rate. | | Existing Condition | Fixture without any type of flow rate reducer. | | Code/Standard | 1. Showerhead: 1.8 GPM at 80 PSI 2. Lavatory Faucet: 1.2 GPM at 60 PSI 3. Kitchen: 2.2 GPM at 60 PSI 4. Public lavatory faucet: 0.5 GPM at 60 PSI | | Industry Standard Practice | N/A | |
| **1.2 Technical Description** | Please reference WPSCGCCWH180504A Revision 0 Section 1.2 Technical Description  This workpaper measures allow for energy to be saved from the installation of Flow Control Valves (FCV) at faucets or showerheads. These control valves act as a converging-diverging section with a throat in which the flow area is reduced to impede full flow while retaining pressure. The reduction in flow rate offsets the amount of hot water used, in effect the energy demand by the water heating source is reduced. |
| Measures | Measures and Codes   |  |  |  |  | | --- | --- | --- | --- | | **Measure Codes** | | | **Measure Name** | | SCG | SDG&E | SDGE Workpaper Msr IDs  (WPSDGENRWH1209-Rev00-MsrXXX) | | 540747 | 467142  467143 | Msr001 | Lavatory Faucet FCV: 1.00 GPM | | 540740  540741 | 467134  467135 | Msr002 | Res showerhead FCV: 1.00 GPM | | 540749 | 467146  467147 | Msr003 | Public Lavatory Faucet FCV Commercial Buildings: 1.0 GPM | | 540750 | 467148  467149 | Msr004 | Private Lavatory Faucet FCV Commercial Buildings: 1.0 GPM | | 540742  540743 | 467136  467137 | Msr005 | Res Showerhead FCV: 1.25 GPM | | 540744  540745 | 467138  467139 | Msr006 | Res Showerhead FCV: 1.50 GPM | | 540746 | 467140  467141 | Msr007 | Com Showerhead FCV: 1.50 GPM | | 540748 | 467144  467145 | Msr008 | Kitchen Faucet FCV: 1.5 GPM |   Note: SDG&E has two measure codes per measure to account for each available delivery type (Direct Install and Downstream Incentive) |
| Code for All Measures | Please reference WPSCGCCWH180504A Revision 0 Section 1.4.2 Codes and Standards Analysis  Figure I: Lavatory faucets and aerator Title 20 requirements  *Screen Clipping*  Figure II: Kitchen faucets and aerator Title 20 requirements  *Screen Clipping*  Figure III: Showerheads Title 20 requirements  Screen Clipping  Table IX: Code Summary   |  |  |  | | --- | --- | --- | | **Code** | **Reference** | **Effective Dates** | | Title 20 (2017) | Section 1605.1(h). Plumbing Fittings | 1. Lavatory faucet and aerators: July 1, 2016 2. Kitchen faucets and aerators: January 1, 2016 3. Showerheads: July 1, 2018 | |
| Requirements | Please reference WPSCGCCWH180504A Revision 0 Section 1.1 Measure Description & Background. |
| **1.3 Installation Type and Delivery Mechanisms** | |
| Installation Type | AOE |
| Delivery Mechanisms | Please reference WPSCGCCWH180504A Revision 0 Section 1.3 Installation Type and Delivery Mechanisms  Delivery Method Descriptions   |  |  |  | | --- | --- | --- | | **Incentive Method** | **Description** | **DEER Delivery Type** | | Direct Install | The program implements energy efficiency measures for qualifying customers, at no cost to the customer. | DnDeemDI | | Down-Stream Incentive | The customer installs qualifying energy efficient equipment and submits an incentive application to the utility program. Upon application approval, the utility program pays an incentive to the customer. Such an incentive may be deemed or customized. | DnDeemed | |
| **1.4 DEER Data** | |
| Net-to-Gross Ratio | Please reference WPSCGCCWH180504A Revision 0 Section 1.4.1 DEER Data  DEER NTG ID:  All-Default<=2yrs; All other EEM with no evaluated NTGR; new technology in program for 2 or fewer years |
| Effective and Remaining Useful Life | Please reference WPSCGCCWH180504A Revision 0 Section 1.4.1 DEER Data   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Measure | EUL ID | Description | Sector | EUL (years) | RUL (years) | | FCV: Showerhead | WtrHt-WH-Shrhd | Low-Flow Showerhead | Com /Res | 10 | 3.3 | | FCV: Faucets | WtrHt-WH-Faucet | Faucet Effective Useful Life | Com/Res | 20 | 6.67 | |  | | | | | | |
| GSIA | Please reference WPSCGCCWH180504A Revision 0 Section 1.4.1 DEER Data   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Measure** | GSI**A ID** | **Description** | **Sector** | **GSIA Value** | | FCV: Com Showerhead, Com Faucet | Def-GSIA | Default GSIA values | Any | 1 | | FCV: Res Showerhead | Res-LowF-SH-All | Residential low-flow Showerhead; Annual Installation Rate | Res | 0.737 | | FCV: Res Faucets | Res-LowF-FA-All | Residential low-flow Faucet Aerator; Annual Installation Rate | Res | 0.665 | |
| **Section 2. Calculation Methodology** | |
| Energy Savings/Peak Demand Reduction – All Measures | Please reference WPSCGCCWH180504A Revision 0 Section 2 Calculation Methodology |
| **Section 3. Load Shapes** | |
| Load Shape | Please reference WPSCGCCWH180504A Revision 0 Section 3 Load Shapes |
| **Section 4. Cost** | |
| **Section 4.1 Base and Measure Costs** | |
| Base Cost | Please reference WPSCGCCWH180504A Revision 0 Section 4.1 Base Case Cost  The base case cost is zero as this will be not applying any measure. |
| Measure Cost | Please reference WPSCGCCWH180504A Revision 0 Section 4.2 Measure Case Cost for how measure cost estimates were determined.  SDG&E adopts all cost but created SDG&E measure cost IDs for reporting purposes. SDG&E measure cost IDs are included in Ex-Ante tables submission.   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | Application | Installation Type | | Incremental Measure Cost | Full Measure Cost | | | 1st Baseline | 2nd Baseline | | Faucet FCVs | | REA | MEC + MLC  $25.00 + $33.48 = $58.48 | MEC + MLC  $25.00 + $33.48 = $58.48 | N/A | | Showerhead FCVs | | REA | MEC + MLC  $25.00 + $16.74 = $41.74 | MEC + MLC  $25.00 + $16.74 = $41.74 | N/A | |