Short Form Work Paper WPSDGENRWH0015

**Revision 0**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Laminar Flow Restrictors  
For Hospitals and Health Care Facilities**

**January 2, 2018**

# Laminar Flow Restrictors for Hospitals and Health Care Facilities Short Form WP

## Introduction

This short form workpaper (wp) documents the values adopted from SCG’s wp entitled “Laminar Flow Restrictors for Hospitals and Health Care Facilities” (WPSCGNRWH150827A Rev2). SDG&E adopts all the assumptions and values in SCG WPSCGNRWH150827A Rev 2.

## Document Revision History

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| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 1/02/2018 | Eduardo Reynoso / SDGE | Adopted from Southern California Gas Company WorkPaper WPSCGNRWH150827A Revision 0 Dated April 8, 2016 without changes. |
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**Eligibility requirements**

Rebates for this measure are restricted to health care facilities. Only facilities utilizing natural gas powered water heating equipment are eligible for rebates for this measure. Products installed must meet Office of Statewide Health Planning and Development (OSHPD) code and regulation.

Since this is a Retrofit Add-on (REA) measure, rebates do not apply to new construction.

Only LFR models labeled as “Vandal Proof” or are not removable without a proprietary tool are considered for the rebate, with the exception of dialysis and scrub sink locations. There are currently 37 “Vandal Proof” LFRs in the appropriate size options available for purchase.

**Implementation and installation requirements**

This measure is to be implemented in Health/Medical buildings (hospitals, clinics, and nursing homes) of the Commercial sector as a Retrofit Add-on (REA) measure for existing faucets that do not already have a flow restricting device installed.

Table : Measure Summary Table

|  |  |
| --- | --- |
| **Section** | **Value** |
| **1.1 Measure & Baseline Data** | |  |  |  |  |  | | --- | --- | --- | --- | --- | | Measure codes | |  | Measures Characteristics | | | SCG | SDG&E | SDG&E Measure ID | Measure Name | MeasAppType | | ShwFlr001 | 464079  464083 | WPSDGENRWH0015-Rev00-Msr001 | 0.5 GPM Flow Rate Laminar Flow Restrictor being installed on a 2.7 GPM Flow Rate Faucet Base Case | REA | | ShwFlr002 | 464080  464084 | WPSDGENRWH0015-Rev00-Msr002 | 1.0 GPM Flow Rate Laminar Flow Restrictor being installed on a 2.7 GPM Flow Rate Faucet Base Case | REA | | ShwFlr003 | 464081 | WPSDGENRWH0015-Rev00-Msr003 | 1.5 GPM Flow Rate Laminar Flow Restrictor being installed on a 2.7 GPM Flow Rate Faucet Base Case | REA | | ShwFlr004 | 464082 | WPSDGENRWH0015-Rev00-Msr004 | 2.2 GPM Flow Rate Laminar Flow Restrictor being installed on a 2.7 GPM Flow Rate Faucet Base Case | REA |   This energy efficiency measure is applicable to existing faucets in hospitals and health care facilities that have a maximum flow rate of 2.7 GPM or greater. Only facilities that utilize natural gas-powered water heating equipment are eligible to receive incentives for this measure. Natural gas must be supplied by an investor owned utilities (IOU). |
| **1.2 Technical Description** | As cited per SCG workpaper “WPSCGNRWH150827A Rev2”:  Laminar Flow Restrictors (LFRs), also known as laminar flow devices, are “add-on” devices that are installed at the outlet of the faucet spout to reduce water consumption. In practice, LFRs differ from aerators in that they produce a transparent stream of water without introducing air into the flow.The differences between LFRs and aerators are summarized in Table 1.  LFRs have specific applications in the health care industry. The health care industry for the purpose of this work paper consists of any facility that adheres to the Office of Statewide Health Planning and Development (OSHPD) regulations in the state of California. These include but are not limited to:   1. Hospitals (large regional or local) 2. Emergency rooms 3. In-patient and outpatient facilities and medical office buildings connected to or free standing from main hospitals 4. Doctor’s offices (e.g. general practitioners, pediatricians, optometrists, chiropractors, etc.)   Currently, OSHPD specifically bans the use of aerators in the health care industry due to the aerator’s flow control methods and components.[[1]](#endnote-1) The mixing of air and water within the aerator allows airborne bacteria to become waterborne and, in warm stagnant conditions, promote bacterial growth. The increased surface area of aerator components (e.g. screens) allows hard water deposits and biofilm to accumulate within the device which may further harbor increased bacterial growth.  Table 1 : LFR vs. Aerator Comparison Summary   |  |  | | --- | --- | | LFRs | Aerators | | * “Laminar” refers to a stream that flows in parallel layers with no disruption between them * Approved for health care use because of their hygienic advantage: aerosol generation is reduced to a minimum due to the lack of air intake * Water restriction is achieved by using small nozzles (straightening vanes) that are shaped to keep turbulence from forming, preventing air from entering the flow * Flow is clear and transparent | * Use the Venturi effect to introduce air into the water stream * Banned in health care environments, but commonly used in residential and other commercial applications * Restrict water by using screens to introduce air bubbles into the water stream which may allow airborne bacteria to become waterborne * Flow has a white opacity and a soft feel | |
| Code for Measures  (as cited per WPSCGNRWH150827A Rev2) | Applicable codes for this measure are stipulated in Title 20 of the California Code of Regulations Table H-1 and H-4 in ***Figure 1***.    Title 20 code is not considered an appropriate baseline flow rate due to strong evidence of a higher pre-existing/in situ flow rate as defined in **Section 1.5.1.**  **Overview**  The preexisting flow rate of health care faucets has been deemed to be 2.7 GPM from a study completed by Water Saver Solutions. The raw shared survey results are shown in ***Attachment C***. Water Saver Solutions chose 20 hospitals, 1 medical office building and 1 nursing home in SCG territory to make up the shared survey. The shared results can be considered a snap shot of the health care industry in SCG territory. The study results include health care facility locations, faucet counts and types, and the measured flow rates. |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | Installation Type Descriptions   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Installation Type** | **Savings** | | **Life** | | | 1st Baseline (BL) | 2nd BL | 1st BL | 2nd BL | | Retrofit Add-on (REA) | Above Customer Existing (See ***Section 2.1***) | N/A (Above Code Baseline) | RUL (6.67 years) | EUL – RUL (13.33 years) | |
| Delivery Mechanisms | Incentive Method Descriptions   |  |  | | --- | --- | | **Incentive Method** | **Description** | | Direct Install (DirInstall) | The program implements energy efficiency measures for qualifying customers, at no cost to the customer. | | Downstream Rebate (PreRebDown) | 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. | |
| **1.4.1 DEER Data** |  |
| DEER Measure ID | DEER does not contain this type of measure. |
| Net-to-Gross Ratio | NTG Values   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **NTGR ID** | **Description** | **Sector** | **BldgType** | **Measure Delivery** | **NTGR** | | All-Default<=2yrs | All other EEM with no evaluated NTGR; new technology in program for 2 or fewer years | Any | Any | Any | 0.7 | |
| Effective and Remaining Useful Life | EUL and RUL Values   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **EUL ID** | **Description** | **Sector** | **UseCategory** | **EUL (Years)** | **RUL (Years)** | | WtrHt-WH-Faucet | Faucet Effective Useful Life | Com | SHW | 20 | 6.67 | | Measure life = RUL of faucet = 6.67 years | | | | | | |
| Installation Rate (IR) | IR Values   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **GSIA ID** | **Description** | **Sector** | **BldgType** | **ProgDelivID** | **GSIAValue** | | Def-GSIA | Default GSIA values | Com | Cnc, Hsp, Nrs | PreRebDI, PreRebDown | 1 | |
| **Section 2. Calculation Methodology**  **(as cited per WPSCGNRWH161222A Rev0)** | Sample Measure Savings (refer to attached SDGE Ex-ante database tables for a complete list of measures and impacts)   |  |  |  |  |  | | --- | --- | --- | --- | --- | | Measure Description | Climate Zone | Building Type | Therm savings | Water savings -gallons- annual | | Laminar Flow Restrictor for Health Care Facilities - 0.5 GPM Flow Rate | 07 | Cnc | 25.24 | 5425 | | 07 | Hsp | 25.24 | 5425 | | 07 | Nrs | 25.24 | 5425 | |
| **Section 3. Load Shapes** | SDGE:35-OTI-Otherindustrial-PROC OTH |
| **Section 4. Costs** |  |
| Base Case Cost | Baseline costs are $0 since it is an REA measure and the base case would be to do nothing to the faucet. |
| Measure Case Cost | Proposed Measure Costs   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Description** | **Delivery Method** | **Equipment Cost** | **Labor/Installation Cost** | **Total Measure Cost** | | LFR (DI) | Direct Install | $7.27/fixture | $7.00/fixture | $14.27/fixture | | LFR (PreRebDown) | PreRebDown | $7.27/fixture | $0.00/fixture | $7.27/fixture | | Measure Cost ID: SDG-SHW-LamFlowRestrict | | | | | |
| Full and Incremental Cost | Full and Incremental Costs   |  |  |  |  | | --- | --- | --- | --- | | **Installation Type** | **Incremental Measure Cost** | **Full Measure Cost** | | | **1st Baseline** | **2nd Baseline** | | REA, Direct Install | $7.27/fixture + $7.00/labor = **$14.27 per fixture** | $14.27 per fixture | N/A | | REA, PreRebDown | $7.27/fixture = **$7.27 per fixture** | $7.27 per fixture | N/A | | Measure Cost ID: SDG-SHW-LamFlowRestrict | | | | |

1. (2015, May). Section 1226.6. *Health Facility Checklist Section 1226 [OSHPD 3] Clinics*. <http://www.cpca.org/cpca2013/assets/File/Health-Center-Information/Licensing-OSHPD3/OSHPD3-Title%2024/2014-06-27-Primary%20Care%20Clinic_Checklist%20OSHPD%203.pdf> [↑](#endnote-ref-1)