Short Form Work Paper WPSDGENRWH0012

**Revision 1**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Low-Flow Pre-Rinse Spray Valves**

**October 4, 2016**

# Low-Flow Pre-Rinse Spray Valves Direct Install Short Form WP

## Introduction

This short form workpaper (wp) documents the values adopted from SCG’s wp entitled “Low-Flow Pre-Rinse Spray Valves” (WPSCGNRWH121113A Rev 3). The short form also includes a new proposed EUL of “Cook-LowPreRinse” as it will reference the appropriate 5 year life reflecting the lead PA. SDG&E is requesting to have EAR Team create a new EUL for this technology. SDG&E adopts all of the values in SCGWPSCGNRWH121113A Rev 3 with the following exceptions:

1. SDGE took energy savings impact values readily available in DEER READi v.2.4.7 and scaled them based on factors derived from the 2013 DEER ground temperature weather files specific to SDG&E’s specific climate zones;
2. SDG&E only offers this measure as Replace on Burnout (ROB) installation type;
3. SDG&E intends to use the Com-Default>2yrs Net-to-Gross (NTG) ID only;
4. SDG&E intends to use SDG&E direct install contractor specific gross measure costs at an average of $100 ($77.78 for materials + average DI contract labor);
5. SDG&E intends to use the Commercial (Com) building type only; and
6. SDGE intends to use the SDGE35-OTI-Otherindustrial-PROC OTH E3 load shape.

SDG&E used its PA specific approved value for the Low-Flow Pre-Rinse Spray Valves measure.

## Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 04/03/2013 | Charles Harmstead / SDGE | Adopted from Southern California Gas Company WorkPaper WPSCGNRWH121113A Rev1 Dated January 11, 2013 without changes |
| 0.1 | 06/24/2014 | Judelson Enriquez / RMS Energy Consulting, LLC | INTERNAL REVISION ONLY – no material impacts made  1. Updated to new workpaper format.  2. Added measure tables in Section 1, T20 code references and summary table, TOU section, GSIA language and ID table, and load shape table.  3. Generated calculation spreadsheet based on IOU statewide Calculation Template output and added additional columns for Mark M., and removed CZ cost factor adjustment. |
| 1.0 | 10/04/2016 | Eduardo Reynoso/SDGE | 1. Adopted revision changes from Southern California Gas Company (SCG) Workpaper WPSCGNRWH12111ARev3 Dated July 30, 2014.  2.Added new measure “Low Flow Pre-Rinse Spray Valve, 1.28 gpm”  3.Updated MeasAppType to “ROB” and removed “RET”.  4.Update NTG ID to Com-Default>2yrs.  5. Updated IMC cost of $100 for Direct Install.  6. Updated CZ to “Any”, Building Type to “Com”, EUL\_ID to “Cook-LowPreRinse”  7. Scaled SCG’s energy savings values based on factors derived from the 2013 DEER ground temperature weather files specific to SDG&E’s specific climate zones. |

Table : Measure Summary Table

|  |  |
| --- | --- |
| **Section** | **Value** |
| **1.1 Measure & Baseline Data** | Measures are pre-rinse spray valves (PRSV) with different GPM ratings listed below:   * Measure 1: Low Flow Pre-Rinse Spray Valve, 1.07 GPM * Measure 2: Low Flow Pre-Rinse Spray Valve, 1.28 GPM * Measure 3: Low Flow Pre-Rinse Spray Valve, 1.15 GPM |
| **1.2 Technical Description** | PRSV, also referred to as spray nozzles or spray heads, are used in various food service applications such as restaurants and cafeterias by using a knife-edge spray rather than a shower type spray to better focus the available energy and remove loose food debris from plates more efficiently prior to loading them in the dishwasher. |
| Measure 1 | Low Flow Pre-Rinse Spray Valve, 1.07 GPM |
| Measure 2 | Low Flow Pre-Rinse Spray Valve, 1.28 GPM |
| Measure 3 | Low Flow Pre-Rinse Spray Valve, 1.15 GPM |
| Code for Measures 1-3 | 2014 Title-20 Appliance Efficiency Regulations for water heater efficiency and 2005 Energy Policy Act:   * Baseline PRSVs were limited to maximum flow of 1.6 GPM |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | Replace On Burnout (ROB) |
| Delivery Mechanisms | Financial Support - Direct Install |
| **1.4.1 DEER Data** |  |
| DEER Measure ID | DEER does not contain this type of measure. |
| Net-to-Gross Ratio | Com-Default>2yrs |
| Effective and Remaining Useful Life | 5 years (DEER EUL ID: Cook-LowPreRinse) |
| **Section 2. Calculation Methodology** | Scaled SCG’s energy savings values based on factors derived from the 2013 DEER ground temperature weather files specific to SDG&E’s climate zones. |
| **Section 3. Load Shapes** | SDGE:35-OTI-Otherindustrial-PROC OTH |
| **Section 4. Costs** |  |
| Base Cost – Measure 1 | $0 |
| Base Cost – Measure 2 | $0 |
| Base Cost – Measure 3 | $0 |
| Measure Cost – Measure 1 | $100 ($77.78 for materials + average DI contract labor) |
| Measure Cost – Measure 2 | $100 ($77.78 for materials + average DI contract labor) |
| Measure Cost – Measure 3 | $100 ($77.78 for materials + average DI contract labor) |
| Incremental Cost – Measure 1 | $100 ($77.78 for materials + average DI contract labor) |
| Incremental Cost – Measure 2 | $100 ($77.78 for materials + average DI contract labor) |
| Incremental Cost – Measure 3 | $100 ($77.78 for materials + average DI contract labor) |

## Differences From Lead Program Administrator Workpaper

### I. Calculation Methodology Gas Energy Savings Estimation Methodologies

SDGE took energy savings impact values readily available in DEER READi v.2.4.7 and scaled them based on factors derived from the 2013 DEER ground temperature weather files specific to SDG&E’s specific climate zones.

In order to convert SCG energy savings values applicable to SDG&E climate zones, SDG&E developed climate zone specific factors that were applied to the SCG wp energy savings values. These factors are a ratio of the SDG&E Delta-T to the SCG Delta-T (Factor = ΔTSDGE/ΔTSCG). The SCG specific supply water temperature is 68**°**F.

**Equation 1:** SDG&E Delta-T to the SCG Delta-T (ΔTSDGE/ΔTSCG) Factor



**Equation 2:** Scaled SDG&E Energy Savings for Low Flow PRSV 1.07 GPM in CTZ 06

SCG Savings (Therms/yr) \* SDG&E Factor = SDG&E Savings (Therms/yr)

52.4 Therms \* 1.1366 = 59.6 Therms

As indicated above, the energy savings have been updated for SDG&E’s specific climate zones using weather files from the 2013 DEER ground temperature data. The SDG&E climate specific ground water temperatures are found in Tables 2 through Table 7, which exhibit the change in supply H2O oF and result in the altered Therms/yr savings impacts per the affected SDG&E climate zones.

**Table 2: Energy Savings for CZ06 Using 2013 DEER Ground Temperature Data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CZ06** | **GPM** | **Mix H2O °F** | **SDG&E Supply H20 °F** | **SCG Savings Therms/yr** | **SDG&E Factor** | **SDG&E Savings Therms/yr** |
| Base, Pre-Rinse Spray Valve | 1.60 | 114.1 | 61.7 | N/A | N/A | N/A |
| Low Flow Pre-Rinse Spray Valve, 1.07 GPM | 1.07 | 114.1 | 61.7 | **52.4** | 1.14 | **59.6** |
| Low Flow Pre-Rinse Spray Valve, 1.28 GPM | 1.28 | 114.1 | 61.7 | **30.5** | 1.14 | **34.7** |
| Low Flow Pre-Rinse Spray Valve, 1.15 GPM | 1.15 | 114.1 | 61.7 | **43.9** | 1.14 | **49.9** |

**Table 3: Energy Savings for CZ07 Using 2013 DEER Ground Temperature Data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CZ07** | **GPM** | **Mix H2O °F** | **SDG&E Supply H20 °F** | **SCG Savings Therms/yr** | **SDG&E Factor** | **SDG&E Savings Therms/yr** |
| Base, Pre-Rinse Spray Valve | 1.60 | 114.1 | 62.5 | N/A | N/A | N/A |
| Low Flow Pre-Rinse Spray Valve, 1.07 GPM | 1.07 | 114.1 | 62.5 | **52.4** | 1.12 | **58.7** |
| Low Flow Pre-Rinse Spray Valve, 1.28 GPM | 1.28 | 114.1 | 62.5 | **30.5** | 1.12 | **34.2** |
| Low Flow Pre-Rinse Spray Valve, 1.15 GPM | 1.15 | 114.1 | 62.5 | **43.9** | 1.12 | **49.2** |

**Table 4: Energy Savings for CZ08 Using 2013 DEER Ground Temperature Data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CZ08** | **GPM** | **Mix H2O °F** | **SDG&E Supply H20 °F** | **SCG Savings Therms/yr** | **SDG&E Factor** | **SDG&E Savings Therms/yr** |
| Base, Pre-Rinse Spray Valve | 1.60 | 114.1 | 63.7 | N/A | N/A | N/A |
| Low Flow Pre-Rinse Spray Valve, 1.07 GPM | 1.07 | 114.1 | 63.7 | **52.4** | 1.12 | **57.3** |
| Low Flow Pre-Rinse Spray Valve, 1.28 GPM | 1.28 | 114.1 | 63.7 | **30.5** | 1.12 | **33.4** |
| Low Flow Pre-Rinse Spray Valve, 1.15 GPM | 1.15 | 114.1 | 63.7 | **43.9** | 1.12 | **48.0** |

**Table 5: Energy Savings for CZ10 Using 2013 DEER Ground Temperature Data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CZ10** | **GPM** | **Mix H2O °F** | **SDG&E Supply H20 °F** | **SCG Savings Therms/yr** | **SDG&E Factor** | **SDG&E Savings Therms/yr** |
| Base, Pre-Rinse Spray Valve | 1.60 | 114.1 | 64.1 | N/A | N/A | N/A |
| Low Flow Pre-Rinse Spray Valve, 1.07 GPM | 1.07 | 114.1 | 64.1 | **52.4** | 1.12 | **56.8** |
| Low Flow Pre-Rinse Spray Valve, 1.28 GPM | 1.28 | 114.1 | 64.1 | **30.5** | 1.12 | **33.1** |
| Low Flow Pre-Rinse Spray Valve, 1.15 GPM | 1.15 | 114.1 | 64.1 | **43.9** | 1.12 | **47.6** |

**Table 6: Energy Savings for CZ14 Using 2013 DEER Ground Temperature Data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CZ14** | **GPM** | **Mix H2O °F** | **SDG&E Supply H20 °F** | **SCG Savings Therms/yr** | **SDG&E Factor** | **SDG&E Savings Therms/yr** |
| Base, Pre-Rinse Spray Valve | 1.60 | 114.1 | 62.6 | N/A | N/A | N/A |
| Low Flow Pre-Rinse Spray Valve, 1.07 GPM | 1.07 | 114.1 | 62.6 | **52.4** | 1.12 | **58.5** |
| Low Flow Pre-Rinse Spray Valve, 1.28 GPM | 1.28 | 114.1 | 62.6 | **30.5** | 1.12 | **34.1** |
| Low Flow Pre-Rinse Spray Valve, 1.15 GPM | 1.15 | 114.1 | 62.6 | **43.9** | 1.12 | **49.1** |

**Table 7: Energy Savings for CZ15 Using 2013 DEER Ground Temperature Data**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CZ15** | **GPM** | **Mix H2O °F** | **SDG&E Supply H20 °F** | **SCG Savings Therms/yr** | **SDG&E Factor** | **SDG&E Savings Therms/yr** |
| Base, Pre-Rinse Spray Valve | 1.60 | 114.1 | 75.4 | N/A | N/A | N/A |
| Low Flow Pre-Rinse Spray Valve, 1.07 GPM | 1.07 | 114.1 | 75.4 | **52.4** | 1.12 | **44.0** |
| Low Flow Pre-Rinse Spray Valve, 1.28 GPM | 1.28 | 114.1 | 75.4 | **30.5** | 1.12 | **25.6** |
| Low Flow Pre-Rinse Spray Valve, 1.15 GPM | 1.15 | 114.1 | 75.4 | **43.9** | 1.12 | **36.9** |

### Calculation File Using 2013 DEER Ground Water Temperature

 