Short Form Work Paper WPSDGENRRN0009

**Revision 2**

**San Diego Gas & Electric**

**Energy Efficiency Engineering**

**Anti-Sweat Heat (ASH) Controls**

**December 15, 2016**

# SDG&E Anti-Sweat Heat (ASH) Controls

## Introduction

This short form workpaper documents (WP) the values adopted from SCE WP entitled “Anti-Sweat Heater (ASH) Controls” (SCE13RN009.2 Anti-Sweat Heater Controls). SDG&E adopts all of the values in SCE13RN009.2 R2 Anti-Sweat Heater (ASH) Controls (product codes RF-12098 and RF-48112), with the following exceptions:

1. SDG&E only offer low temperature ASH Controls with product codes R-F11 (402255).
2. This measure cannot be used in conjunction with SDG&E Measure 402157(R-E11), Special Doors with Low/No ASH on Low Temp Display Case.

## Document Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 0 | 08/29/2012 | N/A | Adopted from SCE workpaper titled  WPSCNRRN0009.0 - Anti-Sweat Heat (ASH)  Controls .doc.  Savings for CZ07 found using  the average incremental savings factor from  the READi Tool for three other refrigeration  measures for CZ06 to CZ07. The NTG ratio  was updated using DEER 2011 NTG ratios.  The NTG for Commercial Direct Install was  used, as this measure falls under the SDG&E  Commercial Direct Install program. NTG  ratios for Express Efficiency and OBF were  removed from the work paper. |
| 1 | 08/26/2014 | Phillip Hasley  (Hasley Consulting) | - Adopted SCE Work Paper SCERN009  .1  - Removed Table of Contents  - Replaced summary tables with At-A-  Glance Summary  - Updated EUL\_ID  - Updated NTG  - Added GSIA  - Updated load shapes  - Updated building types |
| 1.1 | 05/21/2015 | Phillip Hasley  (Hasley Consulting) | -Updated NTG ID Com-Default-HTR-di  to Com-Default-HTR-di (if applicable)  - Added Lookup Table ID Summary |
| 2.0 | 12/15/2016 | Eduardo Reynoso (SDG&E) | -Adopted SCE Workpaper titled “SCE13RN009.2 ASH Controls\_Final.docx”  -No Values modified  -New Short Form Workpaper Template |

## Measure Summary

Table 1: Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form workpaper documents ex-ante load impacts and cost-effectiveness values for installing Anti-Sweat Heater (ASH) Controls based on humidity for reach-in or display freezers and coolers. The base energy consumption and measure energy consumption values are from SCE’s workpaper, SCE13RN009, Revision 2. Since SDG&E’s measure offering is different than that of SCE’s, SDG&E’s product code has been substituted to create a total of 1 (one) offering versus the 2 with SCE. |
| **1.1 Measure & Baseline Data** | Measures:  Measure 1: (Not offered) – Low Temperature Display Case Anti Sweat Heat Control  Measure 2: 402255 – Medium Temperature Display Case Anti Sweat Heat Control |
| **1.2 Technical Description** |  |
| Measures | Refer to SCE Workpaper Requirements |
| Code for All Measures  (As Cited per SCE Workpaper and Document Revision History) | Title 20  The 2014 Appliance Regulations [422] addresses Walk-in Coolers and Freezers with Transparent Reach-in Doors and specifies the limit of ASH power draw based on square footage. Section 1605.1(a)(5)(C)(2) states:  ***If the appliance has an anti-sweat heater with anti-sweat heat controls, and the total door rail, glass, and frame heater power draw is more than 7.1 watts per square foot (W/ft²) of door opening (for freezers) and 3.0 watts per square foot (W/ft²) of door opening (for coolers], the anti-sweat heat controls shall reduce the energy use of the anti-sweat heater in a quantity corresponding to the relative humidity in the air outside the door or to the condensation on the inner glass pane.*** |
| Requirements  (As Cited per SCE Workpaper and Document Revision History) | * The proposed device must sense the relative humidity in the air outside of the display case and reduce or turn off the glass door (if applicable) and frame anti-sweat heaters at low humidity conditions. Equivalent technologies that can reduce or turn off anti-sweat heater based on the amount of condensation formed on the inner glass pane may also qualify. Power reduction should occur when relative humidity levels reach 55% and lower. Power reduction should decrease by at least 2% for every percentage the humidity falls below 55%. * This solution cannot be used in conjunction with Refrigeration - Special Doors with Low/No ASH on Low Temp Display Case, product code 402157. * The linear footage of the installed night cover must be properly measured as the incentive is based on the linear footage of the installed night cover. |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| Installation Type | Retrofit Add-on (REA) |
| Delivery Mechanisms | * Downstream Rebate – Deemed * Direct Install - The program implements energy efficiency measures for qualifying customers, at no cost to the customer. |
| **1.4.1 DEER Data** |  |
| Net-to-Gross Ratio | Com-Default>2yrs |
| Effective and Remaining Useful Life | GrocDisp-ASH (12 years)  GrocDisp-ASH (4 years) |
| **Section 2. Calculation Methodology** | DEER 2016 |
| Energy Savings/Peak Demand Reduction – All Measures  (As Cited by SCE Workpaper per Document History Revision) | **Anti-Sweat Heater (ASH) Controls (SCE:** **RF-12098 and RF-48112); (SDG&E: 402255).**  The measures are weather sensitive and the building energy simulation tool eQuest Refrigeration 3- 65 was used to determine the annual impacts. The 2004-2005 Database for Energy Efficiency Resources (DEER) Update Study final Report [26] has included the measures of Freezer ASH Controls (D03-230) and Cooler ASH Controls (D03-231).  Summary of DEER Measures and Corresponding Solution Codes   |  |  |  |  | | --- | --- | --- | --- | | **SDGE Solution Code** | **Measure Name** | **DEER05 Measure ID** | **DEER08 Measure ID** | | N/A | Freezer ASH Controls | D03-230 | D08-NE-GrocRefg-FixtDoors-LowTemp-FxdAntiSwt-HmdAntiSwt | | RF-11 (402255) | Cooler ASH Controls | D03-231 | D08-NE-GrocRefg-FixtDoors-MedTemp-FxdAntiSwt-HmdAntiSwt |     Base Case Energy Consumption: Source: SCE eQuest Calculations.  Measure Energy Consumption: Source: SCE eQuest Calculations, Energy Savings (Base Case – Measure): Source: SCE eQuest Calculations. |
| **Section 3. Load Shapes** | SDGE:09-GRO-Grocery-REFG |
| **Section 4. Costs** |  |
| **Section 4.1 Base and Measure Costs** | All Downstream rebate cost cite SCE Workpaper per Document Revision History |
| Base Cost |  |
| 402255 | $0.00 (SCE Product Code RF-12098 and RF-48112) |
| Measure Cost |  |
| 402255 | $46.55 (SCE Product Code RF-12098 and RF-48112) |

## Differences From Lead Program Administrator Workpaper

Although the savings calculations and costs are the same with the adoption of PG&E’s workpaper, the offerings slightly differ. The lead PA offers only 2 product codes, RF-48112 and RF48112 to account for both Low and Medium Temperature Display Case Anti Sweat Heat (ASH) Control whereas, SDG&E only offers Medium Temperature Display Case Anti-Sweat Heat Controls.