Work Paper PGE3PHVC156

**Revision 2**

**Short Form**

**Southern California Edison**

**Condenser Coil Cleaning**

**Introduction**

This short form workpaper documents (WP) the values adopted from PGE’s WP entitled “Condenser Coil Cleaning” (PGE3PHVC156\_R4). SCE adopts all the values in PGE3PHVC156\_R4 – Condenser Coil Cleaning, with the following exceptions.

* This Workpaper Short Form is applicable for SCE’s 2019 program cycle
* Changed applicable climate zones to only SCE climate zones.
* Added Up-Stream Programs: Up-Stream delivery mechanism, Financial Support: Down-Stream Incentive – Deemed, and Financial Support: Direct Install.
* Corrected existing issue with incorrect values mapping from PGE calculation template for kWh and kW.
* Added clarification on SCE’s incentive method description and applicability.
* For the 2019 program year, the measure application type has been updated to Retrocommissioning, “BRO-RCx” with reporting 1/1/2019 through 12/31/2019.

# Document Revision History

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| --- | --- | --- | --- |
| **Rev** | **Date** | **Author** | **Summary of Changes** |
| 1 | 12/27/2018 | Lake Casco, TRC | * Transferred savings to calculation templates 2018 program year. * Changed applicable climate zones to only SCE climate zones. * Added Up-Stream Programs: Up-Stream, Financial Support: Down-Stream Incentive – Deemed, Financial Support: Direct Install delivery mechanisms. * Fixed savings mapping issues from previous PGE calculations.   General Policy Requirements:   * 2018 Workpaper Updates are primarily in response to D.16-08-019 which created the Behavioral, Operational, and Retrocommissioning (BRO) measure classification with EUL values of one to three years with retrocommissioning assigned a three-year EUL. Resolution E-4818 directed that all measures which utilize a degraded performance baseline and/or are restorative of performance in nature be classified as retrocommissioning. |
| 2 | 12/27/2018 | Lake Casco, TRC | * Transferred savings to calculation templates for 2019 program year. * The install type has been updated to Retrocommissioning, “BRO-RCx”.   General Policy Requirements:   * 2019 Workpaper updates are primarily in response to Resolution E-4818 which added new measure application types including but not limited to Add-On Equipment (AOE) and BRO-Retrocommissioning (BRO-RCx). |

**Measure Summary**

Table 1: Measure Summary Table

| **Section** | **Value** |
| --- | --- |
| **Summary & Purpose** | This short form work paper details the cleaning of condenser coils on nonresidential split-system and unitary HVAC equipment. The savings values are based on PGE’s workpaper PGE3PHVC156\_R4 – “Condenser Coil Cleaning” document.  The target market for this measure is non-residential buildings served by unitary direct expansion (DX) and split systems which do not serve process or refrigeration loads. These measures are defined for all SCE California climate zones. |
| **1.1 Measure & Baseline** | Baseline  Uncleaned, functional condenser coil.  Measure  Clean condenser coils on qualifying units. |
| **1.2 Technical Description** |  |
| **Measures** | AC-20779 - Condenser Coil Cleaning on Small Pkg AC system with No TXV (PGE ID: HV393)  AC-20780 - Condenser Coil Cleaning on Small Pkg AC system with TXV (PGE ID: HV394)  Dirty or fouled condenser coils restrict air flow, reduce heat transfer efficiency and compressor efficiency, and can increase compressor run time. Coil cleaning eliminates air blockages between fins and can remove leaves, dust, grime, and other contaminants from the fin and tube heat transfer surfaces thus improving heat transfer efficiency, decreasing compressor run time, and increasing efficiency.  Refer to PGE3PHVC156\_R4 Section 1.2 for detailed technical description. |
| **Code for All Measures** | These maintenance measures are not governed by either state or federal codes and standards. The document Standard 180-2008, Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems5 may be used by QM programs as a guide for measure implementation. Only licensed California contractors will participate in the program. As required by the California State Licensing Board, contractors will be responsible for meeting all applicable codes. In general, maintenance and repairs do not require permits. |
| **Requirements** | Participating contractors must ensure the customer facility is physically located within the service territory of the Investor Owned Utility (IOU) administering the program, and that the customer receives electric services from that IOU. Other terms and conditions are set by individual programs.  This measure requires field documentation of the existing conditions that verify the measure was necessary and that the measure was successfully applied. |
| **1.3 Installation Type and Delivery Mechanisms** |  |
| **Installation Type** | Deviation. Install type changed from Retro-Commissioning (RC) to **BRO-Retrocommissioning (BRO-RCx)** |
| **Delivery Mechanisms** | Mid-Stream Programs: Mid-Stream Incentive  Deviation from PG&E, Adding:   * **Financial Support: Direct Install** * **Financial Support: Down-Stream Incentive – Deemed** * **Up-Stream Programs: Up-Stream Incentive**   For SCE, incentive methods include On-bill Finance/Loan - The program offers financing for the cost an efficient measure as part of the utility bill. This can be an add-on option to an existing program or can serve as an organizing principle for its own program. |
| **1.4.1 DEER Data** |  |
| **Net-Gross-Ratio** | Deviating from PG&E’s NTG Section.  All Non-Upstream NTG ID:   * NonRes-sAll-mHVAC-RCA (NTGR: 0.73)   Midstream & Upstream NTG IDs:   * Com-Default>2yrs (NTGR: 0.60) * Ind-Default>2yrs (NTGR: 0.60) * Agric-Default>2yrs (NTGR: 0.60) |
| **Effective and Remaining Useful Life** | EUL ID: NonRes-RCx-Operational (EUL: 3.0, RUL: 1.0) |
| **Section 2. Calculation Methodology** |  |
| **Energy savings/Peak Demand Reduction – All Measures** | Energy savings and demand reduction estimations for Condenser Coil Cleaning measures are determined according to the prescriptive method presented in the 2013 Workpaper Disposition for Non-Residential HVAC Rooftop Quality Maintenance. The Disposition states that UES values for Condenser Coil Cleaning shall be derived from DEER RCA UES values by applying a multiplier of 0.125. This multiplier is applied to the energy, demand and therms DEER 2019 RCA values for applicable climate zones and building types.  Refer to PGE3PHVC156\_R4 Section 2 for more details. |
| **Section 3. Load Shapes** | DEER:HVAC\_Split-Package\_AC |
| **Section 4. Costs** |  |
| **Section 4.1 Base and Measure Costs** | Equipment and labor costs for cleaning condenser coils were derived from a cost survey conducted of active, program-participating contractors and technicians.  Refer to full workpaper PGE3PHVC156\_R4 Section 4 for detailed costing methodology. |
| **Base Cost** | Base costs for all measures: $0.00 |
| **Measure Cost** | The costs per-ton cooling for cleaning condenser coils are:  Material: $0.72  Labor: $18.79 |

**Savings and Calculation Methodology**

The energy (kWh) and demand (kW) savings reported in the PGE calculation file were switched. The SCE calculation template has been updated to correctly report these savings.

**Costs**

This short form made no changes to the adopted PGE costs.

**Attachments:**

PGE3PHVC156.2\_A1 - Calc Templates\_2019