

Phase I Ex Ante Review Findings

Table 1-1: Project Information

IOU	Pacific Gas & Electric
Application ID	2K13211225
Application Date	August 5, 2013
Program ID	PGE4042
Program Name	Core Retrocommissioning Program
Program Year	2013
Itron Project ID	X419
IOU Ex Ante Savings Date	November 20, 2013
CPUC Staff Measure Name	Retrocommissioning
Project Description	39 RCx measures at six healthcare campuses
Date of CPUC Staff Review(s)	January 13, 2014
Primary Reviewer / Firm	Rachel Murray / DNV GL
Review Supervisor / Firm	Joseph Ball / Itron
CPUC Staff Project Manager	██████████ / California Public Utilities Commission, Energy Division
CPUC Staff Policy Authorization (as needed)	TBD
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
CPUC Staff Recommendation	CPUC Staff waives further reviews of this project, but direct IOU to follow the guidance for RCx-8 and RCx-9 for the remaining retrocommissioning measures. The IOU will apply the GRR of 0.9 for this project at claims.

Measure Description

The RCx project involves implementation of 39 energy efficiency measures deemed appropriate for three hospital campuses and three medical office campuses. While each site has multiple buildings of various sizes, the combined square footage is approximately [REDACTED] sq. ft. The hospitals operate continuously year round whereas the medical office buildings operate during regular business hours. At boilers, measures include: optimization of boiler controls, steam pressure resets, hot water temperature resets, and lockout schedules. At air handling units, measures include: optimization of AHU scheduling, economizer controls, cold/hot deck temperature controls, and supply air temperature reset controls. At air conditioning units, measures include: optimization of operating schedules, supply air temperature resets, and static pressure resets. At terminal boxes, measures include: optimization of operating schedules and minimum flow adjustments.

Summary of Review

The Investor-Owned-Utility (IOU) submitted the following documents between the dates of 9/18 and 12/29/2013 for this Phase I review:

- xxxx Level of effort by campus.xlsx;
- xxxx E + G Usage History.pdf;
- 2K13211225 (RCx) xxxx WorkBook.xlsx;
- 2K13211225 (RCx) xxxx SOW.pdf;
- 2K13211225 (RCx) xxxx Healthcare Application.pdf;
- 2K13211225 xxxx RCx Report and Summary.zip;
- 2K13211225 (RCx) xxxx – IA.pdf;
- xxxx RCx Savings Summary.xlsx;
- 2K13211225 – EMS Screenshots xxxx.zip (multiple);
- 2K13211225 – xxxx RCx Calculation Part 1.zip & 2K13211225 – xxxx RCx Calculation Part 2.zip;
- 2K13211225 – xxxx RCx Photos Part 1.zip through 2K13211225 – xxxx RCx Photos Part 3.zip;
- 2K13211225 – xxxx RCx Previous Study and Equipment List.zip;
- 2K13211225 – xxxx RCx Trend Data Part 1.zip through 2K13211225 – xxxx RCx Trend Data Part 3.zip;
- 2K13211225 – xxxx RCx Utility Analysis.zip; and
- xxxx MOB 1 and MOB 2 Boiler lock out.xlsx.

Due to the large size of the application, the CPUC review staff decided to review the measures at one campus that accounted for two-thirds of the annual natural gas savings in the application: RCx-8 and RCx-9. Upon review, Staff waives further reviews of this application, but directs PG&E to follow the guidance provided for the reviewed measures and to apply that guidance to the remainder of the measures in the application.

Review Conclusion

CPUC Staff waives further reviews of this application; but directs PG&E to follow the guidance provided for the reviewed measures and to apply that guidance to the remainder of the measures in the application. The IOU will apply the GRR of 0.9 for this project at claims.

Summary of CPUC Staff Requested Action by the IOU

For some background to inform our review, we looked within the “Retro-Commissioning Investigation Report” dated November 20 and uploaded to CMPA on December 16, 2013. The M&V plan defines the appropriateness of the use of the Building Optimization Analysis (BOA) tool and the minimum levels of M&V established by the RCx program depending upon the amount of savings per measure as shown in Table 1-2.

Table 1-2: Savings Analysis and M&V Requirements of RCx Program

Measure Size	Initial Savings Calculation by Provider	Source of Initial Savings Submitted	Source of Final Savings Claimed	M&V Required
Small (BOA Tool Applies)	Savings < 75,000 kWh/yr or Savings < 5,000 th/yr	BOA Tool Results	BOA Tool Results	Pre- and Post-Implementation Snapshot
Small (BOA Tool Does Not Apply)	Savings < 75,000 kWh/yr or Savings < 7,500 th/yr	Initial Savings Calculation by Provider	Initial Savings Calculation by Provider verified by snapshots	Pre- and Post-Implementation Snapshot
Medium	75,000 kWh/yr < Savings < 200,000 kWh/yr or 7,500 th/yr < Savings < 20,000 th/yr	Initial Savings Calculation by Provider	Initial Savings Calculation, Adjusted for Pre- and Post-Implementation Trends	Pre- and Post-Implementation Trend Logging

Measure Size	Initial Savings Calculation by Provider	Source of Initial Savings Submitted	Source of Final Savings Claimed	M&V Required
Large	200,000 kWh/yr < Savings or 20,000 th/yr < Savings	Initial Savings Calculation by Provider	Calculations Based on Pre- & Post-Implementation Measurements	Pre- and Post-Implementation Trend Logging

RCx-8 involved optimizing economizer controls for AHUs 1 to 20. BOA is considered an appropriate analysis tool for determining energy savings for these type of measures when the savings are “small,” as defined in **Error! Reference source not found.**2. C-BOA, a customized version of BOA must be used whenever a given measure is deemed “medium” or “large.” Using these size definitions, **Error! Reference source not found.**1-3 shows the sizes of RCx-8 and RCx-9 for each of the 20 AHUs. For those that are “medium” or “large,” whether pre-implementation trend data were collected is shown along with the resulting recommendation for each AHU.

To bring the application into compliance with the program requirements set forth in Table 1-2, CPUC staff recommends that the IOU follow the directions provided in the right-most column of Table 1-3. This same approach should be used for all 39 measures in the application.

Table 1-3: EAR Recommendations Regarding RCx-8 and RCx-9

AHU	Size of RCx-8 Measure	Size of RCx-9 Measure	Description of C-BOA Customization Used, if any	EAR Ex Ante Savings Analysis and M&V Recommendation, if any
AHU-1	Small	Medium		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-2	Small	Medium		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-3	Small	Medium		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-4	Small	Medium		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-5	Small	Medium		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-6	Small	Medium		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-7	Small	Small		
AHU-8	Small	Medium		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-9	Medium	Small		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA

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AHU	Size of RCx-8 Measure	Size of RCx-9 Measure	Description of C-BOA Customization Used, if any	EAR Ex Ante Savings Analysis and M&V Recommendation, if any
AHU-10	Large	Large	2 weeks of pre-RCx trend data	Collect 2 weeks of post-RCx trend data to determine final savings
AHU-11	Small	Medium		Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-12	Small	Small	2 weeks of pre-RCx trend data	
AHU-13	Medium	Large	2 weeks of pre-RCx trend data	Collect 2 weeks of post-RCx trend data to determine final savings
AHU-14	Small	Medium	2 weeks of pre-RCx trend data	Collect 2 weeks of post-RCx trend data to customize C-BOA
AHU-15	Small	Small		
AHU-16	Small	Small		
AHU-17	Small	Small	2 weeks of pre-RCx trend data	
AHU-18	Small	Medium	2 weeks of pre-RCx trend data	Collect 2 weeks of pre- and post-RCx trend data to customize C-BOA
AHU-19	Medium	Medium	2 weeks of pre-RCx trend data	Collect 2 weeks of post-RCx trend data to determine final savings
AHU-20	Small	Small	2 weeks of pre-RCx trend data	