Ex Ante Review Findings

Table 1-1: Project Information

	Complete table; use TBD when unknown
IOU	PG&E
Application ID	HEEP-74
Application Date	July 3, 2012
Program ID	HEEP
Program Name	Healthcare Energy Efficiency Program
Program Year	2012
Itron Project ID	X166
IOU Ex Ante Savings Date	August 9, 2012
ED Measure Name	TBD
Project Description	Compressor Array and Lighting Fixture Retrofits at [redacted]
Date of ED Review(s)	August 7, 2012
Primary Reviewer and Firm	Rachel Murray, P.E./KEMA
Review Supervisor and Firm	Leonel Campoy/Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	Savings not approved, pending fulfillment of data request for more information.

Measure Description

A hospital complex in [redacted] is served by a central air compressor system that supplies medical air throughout the campus at all times. The program application identifies two energy efficiency measure (EEM) categories. The first measure, EEM-1, involves replacing two 75 Horsepower (hp) compressors, which alternate operation every four hours, with nine five-hp compressors controlled by a three stage array to add the ability to sequence and modulate the compressors to match the demand for medical air. The second measure, EEM-2, will replace linear fluorescent lighting fixtures, T12 lamps and magnetic ballasts, with high lumen, 800-series T8 lamps with low ballast-factor, program-start ballasts.

Summary of Review

Willdan Energy Solutions, dba Intergy Corporation, provided a report detailing the findings of a preliminary energy audit conducted in March 2012 along with proposing two types of energy efficiency measures (named *HEEP-74_[redacted]_-_Phase_II_Audit_Report_7-3-12.pdf*). In addition to the report, they provided a spreadsheet detailing the savings calculations for the proposed retrofits (named *HEEP-74_[redacted]_-_Phase_II_Audit_Report_7-3-12.xlsx*).

For EEM-1, the annual baseline energy usage determination is based upon assuming that one of the two compressors operates at full load throughout the year. This oversimplification may overstate the baseline since the rate of compressed air production would vary with usage to maintain a constant pressurization of the medical air. There are several gaps in the information as listed below:

- EUL and RUL are missing for the existing pair of compressors. These are needed to determine the savings using a normal-replacement baseline.
- Missing a photo of the nameplate of one of the existing compressors and a detailed description of the control strategy of the existing compressor pair. Given that the site has an energy management system (EMS), more information may be available to document the existing operating conditions.
- Missing an explanation for the significant reduction in the compressor plant size--the existing compressors have 75 hp motors whereas the proposed compressor array having nine 5 hp motors that provides a combined motor capacity of 45 hp. It may be necessary to look at the compressor load curves for both systems.
- Missing an explanation for the reduction of the proposed motor efficiency relative to the existing motor efficiency (90.0% vs. 94.5, respectively).
- Missing a description of what would normally be installed upon replacement of the existing compressors at the end of the EUL, i.e., what is the industry standard practice?

For EEM-2, the annual energy consumption was determined by multiplying the reported annual hours of use for each lighting fixture by the existing fixture type and wattage. For those fixture retrofits that also include the addition of a lighting control device, a multiplier is added to the equation when calculating the post-retrofit energy usage. Sufficient information was provided to assess the savings using an early-replacement baseline, but not enough information to assess the savings at the end of the useful lives of the equipment to be replaced, i.e., what is the industry standard practice for linear fluorescent replacements in hospitals given that Title 24 requirements do not serve as a baseline for the project?. The effective useful lives (EULs), in years, and remaining useful lives (RULs), in years, of the existing lighting fixtures are needed to determine the savings using a normal-replacement baseline.

Review Conclusion

The Energy Division (ED) is unable to complete the Ex Ante Review with the submitted information and cannot approve the project's estimated energy savings. Pending submission of the additional data requested, listed below, and a further opportunity to review the proposed savings estimates, the ED will complete the Ex Ante Review at a later date.

Summary of ED Requested Action by the IOU

The ED requests and recommends that the IOU submit the following documentation by ~~August~~ September 11~~23~~, 2012 **(**14 days from submittal date to IOU) to allow for the completion of the Ex Ante Review:

1. For EEM-1, provide the EUL and RUL of the existing pair of compressors to facilitate the determination of the savings using a normal-replacement baseline.
2. For EEM-1, provide a photo of the nameplate of one of the existing compressors and describe the control strategy of the existing compressor pair. Given that the site has an energy management system (EMS), indicate whether available information from the EMS may better inform and confirm the existing operating conditions and submit available EMS data trends.
3. For EEM-1, provide time series flow profile along with kW for the existing compressor plant to assess the compressor plant efficiency.
4. For EEM-1, provide the scope of the project describing the current compressed air system and the proposed compressor system and its staging sequence.
5. For EEM-1, provide CAGI datasheet for the proposed compressors.
6. For EEM-1, provide an explanation for the proposed significant reduction in the total compressor plant capacity, from 75-hp down to 45-hp. Provide the compressor load curves for both the pre-existing and proposed systems.

7. For EEM-1, provide a brief discussion regarding the decreased proposed motor efficiency relative to the existing motor efficiency (90.0% vs. 94.5%).
8. For EEM-1, provide a description of the air compressor system that would normally be installed at the end of the EUL of the existing compressor system, i.e., identify what is the industry standard practice.
9. For EEM-2, provide the EUL and RUL of the existing lighting equipment to facilitate the determination of the savings using a normal-replacement baseline and identify what is the industry standard practice for this lighting replacement application.

Table 1-2: Project Overview

Description	IOU Proposed Ex Ante Data	ED Recommendations
Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures)	Compressor Array Retrofit: Early Replacement Lighting Fixture Retrofits: Early Replacement of current lighting fixtures with magnetic ballasts	TBD; need RUL of the existing equipment to determine the baseline
Project Cost Basis (Full Cost, Incremental Cost)	Full Cost	Full cost applies if early replacement baseline applies and incremental cost applies if normal replacement baseline applies
RUL (Early retirement projects only, otherwise N/A (not applicable))	RULs not provided	IOU to provide; assessment not completed
EUL	EULs not provided	IOU to provide; assessment not completed
First Year kWh Savings	821,055 kWh	TBD
First Year Peak kW Savings	108.4 kW, Peak	TBD
First Year Therms Savings	Not Applicable	Not Applicable
kWh Savings (RUL Period)	Not Provided	TBD
Peak kW Savings (RUL Period)	Not Provided	TBD
Therms Impact (RUL Period)	Not Applicable	Not Applicable
kWh Savings (EUL thru RUL Period)	EUL/RUL not provided	IOU to provide; assessment not completed
Peak kW Savings (EUL thru RUL Period)	EUL/RUL not provided	IOU to provide; assessment not completed
Therms Savings (EUL thru RUL Period)	Not Applicable	Not Applicable
Annual Non-IOU Fuel Impact (RUL Period)	Not Applicable	Not Applicable
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	Not Applicable	Not Applicable
Net-to-Gross Ratio	Not provided	Assessment not completed

Table 1-3: Detailed Review Findings

Reviewed Parameter	Analysis
Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: In situ equipment implies early replacement
	ED Assessment: To be reviewed subsequent to the transmission of additional data as requested
	ED Recommendation: Provide requested information regarding existing equipment to determine the baseline energy usage
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Full cost
	ED Assessment: To be reviewed subsequent to the transmission of additional data as requested
	ED recommendation: Full cost applies for as long as early replacement baseline applies and incremental cost applies once normal replacement baseline applies
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: Not provided
	ED Assessment: To be reviewed subsequent to the transmission of additional data as requested
	ED recommendation: TBD
EUL	IOU Proposal: Not Provided
	ED Assessment: To be reviewed subsequent to the transmission of additional data as requested
	ED recommendation: Consult DEER or CA Energy Efficiency Manual to determine the EUL
Savings Assumptions	IOU Proposal: EEM-1: A simple spreadsheet method was used to estimate the savings for this project where baseline energy consumption was simply a multiplication of full load kW of a 75 hp compressor and the annual operating hours, and the energy consumption of the proposed compressor system was estimated by multiplying the full load kW of the proposed compressors with their assigned operating hours. EEM-2: A simple spreadsheet was used where the lighting power and annual operating hours to estimate the lighting savings of this project
	ED Assessment: Unable to assess energy savings for EEM-1 and EEM-2 due to missing information
	ED Recommendation: TBD
Calculation Methods/Tool review	IOU Proposal: A simple spreadsheet method was used to estimate the savings for this project
	ED Assessment: For EEM-1, a bin analysis of the trend data for the baseline

Reviewed Parameter	Analysis
	operations would be helpful. For EEM-2, methods sufficient for early-replacement baseline, but insufficient for normal-replacement baseline.
	ED Recommendation: TBD
Pre- or Post-Installation M&V Plan	IOU Proposal: For EEM-1, provide two weeks of trend data at unspecified intervals for the installed system. For EEM-2, provide photos and verification of hours.
	ED Assessment: Couldn't be assessed
	ED Recommendation: Provide an M&V plan
Net-to-Gross Review	IOU Proposal: Not provided
	ED Assessment: No assessment was performed
	ED Recommendation: An assessment may be warranted