

Phase 1 Final Ex Ante Review Findings

Table 1-1: Project Information

IOU	PGE
Application ID	HEEP 74A
Application Date	7/3/2012
Program ID	PGE2206
Program Name	Healthcare Energy Efficiency Program
Program Year	2012
Itron Project ID	X166 A
IOU Ex Ante Savings Date	6/24/2013
ED Measure Name	Air Compressor Retrofit
Project Description	Replace two 75 HP medical air compressors with three 15 HP medical air compressors
Date of ED Review(s)	7/17/13
Primary Reviewer / Firm	Keith Rothenberg/Energy Metrics
Review Supervisor / Firm	Kunal Desai/Itron Inc
ED Project Manager	[REDACTED]
ED Policy Authorization (as needed)	
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	The ex ante savings are approved at the ED estimated values of 60,403 kWh and 7.2 kW demand reduction for the RUL period, and zero impacts for the EUL-RUL period. The IOU should submit project cost invoices.

Measure Description

A hospital complex is served by a central air compressor system that continuously supplies compressed air for medical use throughout the campus. The measure involves replacing two 75 horsepower (HP) compressors, which alternated in operation every four hours, with three 15 HP compressors. Each 15 HP compressor has 4 individual 5 HP compressors. One of the four 5 HP compressors on each unit is a redundant compressor as required by code for medical applications. The three units are controlled to stage the compressors to match the demand for compressed air.

Summary of Review

The Investor Owned Utility (IOU) submitted the following documents for Data Request (DR) 2299 for this Phase 1 review:

- Transmittal Memorandum for DR 2299,
- Facility audit report,
- Various versions of calculation spreadsheets, most recent submission 6/24/2013 via email,
- Compressor specifications and
- Responses to ED review comments.

In addition, this project has been discussed on several telephone calls and email exchanges between the implementation team and ED. The measure was originally submitted as part of project with other measures. During the course of the ED review, the measure was isolated and placed in a separate project application.

In the most recent submission, the IOU estimates the project impacts to be 280,944 kWh and 21.89 kW demand reduction for the RUL period. The IOU estimated impacts for the EUL-RUL period are 84,553 kWh and 13.5 kW demand reduction. ED reviewed the data provided by the IOU and has estimated the impacts for this measure to be 60,403 kWh and 7.2 kW demand reduction for the RUL period. There are no impacts for the EUL-RUL period.

Project cost invoices have not been provided.

Review Conclusion

This is the final ex ante review for this project. The ex ante savings are approved at the ED estimated values of 60,403 kWh and 7.2 kW demand reduction for the RUL period. There are no claimable impacts for the EUL-RUL period. ED expects that measures installed in early retirement projects are more efficient than industry standard practice. The IOU did not

demonstrate that to be the case for this project. However, ED has approved savings for this ISP measure as a one-time exception. The IOU should submit project cost invoices.

Summary of ED Requested Action by the IOU

ED requests that the IOU undertake the recommended steps and submit the following information **due on 8/2/2013 (or 14 days from submittal date to IOU):**

1. Provide project cost invoices.

Table 1-2 Review Findings

Reviewed Parameter	Analysis
<p>Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures) Note: For early retirement projects only, include RUL through EUL baseline)</p>	IOU Proposal: Early Replacement
	ED Assessment: Accept
	ED Recommendation: None
<p>Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)</p>	IOU Proposal: In situ
	ED Assessment: Accept for the RUL period. ISP for the EUL-RUL period
	ED Recommendation: The IOU has not demonstrated that the new compressors exceed ISP. ED has reviewed the IOU minimum efficiency standards for air compressors and found that while medical air compressors are not addressed in the standards, the new compressors generally do not exceed the minimum performance specifications for other compressors with similar capacity. ED expects that measures installed in early retirement projects are more efficient than industry standard practice. The IOU did not demonstrate that to be the case for this project. However, ED has approved savings for this ISP measure as a one-time exception. Therefore, ED has concluded that the impacts for the EUL-RUL period are zero.
<p>Project Cost Basis (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment)</p>	IOU Proposal: Full cost
	ED Assessment: Accept
	ED recommendation: IOU to provide measure cost invoice documentation.
<p>RUL (required for early retirement projects only, otherwise N/A)</p>	IOU Proposal: 5 years= 1/3 of EUL
	ED Assessment: Accept
	ED recommendation: None
<p>EUL (for each measure)</p>	IOU Proposal: 15 years
	ED Assessment: Accept
	ED recommendation: None
<p>Savings Assumptions</p>	IOU Proposal: Complex analysis based on unverified assumptions for key variables such as the baseline compressor operation and the air demand profile used in the analysis.
	ED Assessment: ED's analysis of the measured data indicates that many of

Reviewed Parameter	Analysis
	the assumptions used in the IOU analysis lead to over-estimation of the project impacts.
	ED Recommendation: The IOU should work to reduce the number of assumptions in project impact analysis using measured data, data from manufacturers, and other accepted analysis tools and methods such as those described in the DOE Compressed Air Challenge where possible.
Calculation Methods/Tool review	IOU Proposal: Spreadsheet analysis based on unverified assumptions for key variables.
	ED Assessment: Spreadsheet analysis approach is acceptable.
	ED Recommendation: The IOU should make more effort to utilize industry standard practice methods such as those described in the DOE Compressed Air Challenge.
Pre- or Post-Installation M&V Plan	IOU Proposal: ED recommended that the IOU measure the compressor power and the compressed air system pressure. The IOU measured the post project compressor power and the compressed air system pressure for one week in one minute intervals.
	ED Assessment: Accept
	ED Recommendation: Two weeks of data are usually the minimum required so that week to week variations of demand can be better understood. Future projects should use 2 weeks minimum data collection periods.
Net-to-Gross Review	IOU Proposal: Not addressed
	ED Assessment: TBD
	ED Recommendation: TBD

Table 1-3 Energy Savings Summary

Description	IOU Ex Ante Claim	ED Recommendations
First Year kWh Savings	280,944	60,403
First Year Peak kW Savings	21.89	7.2
First Year Therms Savings	0	0
kWh Savings (RUL Period)	280,944	60,403
Peak kW Savings (RUL Period)	21.89	7.2
Therms Impact (RUL Period)	0	0
kWh Savings (RUL thru EUL Period)	84,553	0
Peak kW Savings (RUL thru EUL)	13.5	0

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Description	IOU Ex Ante Claim	ED Recommendations
Period)		
Therms Savings (RUL thru EUL Period)	0	0
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (RUL thru EUL Period)	N/A	N/A