

## **Phase I Ex Ante Review Findings**

**Table Error! No text of specified style in document.-1: Project Information**

<b>IOU</b>	PGE
<b>Application ID</b>	2K12134527
<b>Application Date</b>	12/14/12
<b>Program ID</b>	PGE21042
<b>Program Name</b>	Savings By Design (Customized Retrofit - Demand Response)
<b>Program Year</b>	2012
<b>Itron Project ID</b>	X263
<b>IOU Ex Ante Savings Date</b>	TBD
<b>ED Measure Name</b>	UPS Retrofit
<b>Project Description</b>	Replace three (3) existing UPS modules with new, more efficient units
<b>Date of ED Review(s)</b>	2/19/13
<b>Primary Reviewer and Firm</b>	Phani Pagadala/Itron
<b>Review Supervisor and Firm</b>	Joseph Ball/Itron
<b>Type of Review (Desk, On-site, Full M&amp;V, Tool)</b>	Desk Review
<b>ED Recommendation</b>	Not approved until incremental costs have been provided and demonstrated to be positive.

## **Measure Description**

This project involves the replacement of three (3) of the five existing Liebert UPS units in a Tier 2 data center. The facility proposes to replace these units with new, more efficient units which will save electricity by operating more efficiently than the existing units.

## **Summary of Review**

Included within the application packet that was received and reviewed during this Phase I review were the following: rebate application, ED EAR template with project information, preliminary savings calculations (Excel) and building electric usage data (18 months).

The subsequent IOU response received during the parallel review process contained revised ex ante calculations, cost quotes for the new UPS units, PA review packet and project correspondences.

The IOU appropriately selected this project as normal replacement, which triggers an industry standard practice (ISP) equipment baseline. The IOU reviewers adjusted the baseline UPS unit efficiencies to the stipulated minimum values as listed in “Energy Efficiency Baselines for Data Centers”. The savings were re-calculated using the estimated UPS loads forecasted for the years 2013-2017 (using trend data for 2007-2012), and the manufacturer performance specifications. Per the PA review, the UPS loading was anticipated to not vary with time of day or season and the DEER peak demand reduction was determined using the same assumptions.

The peak demand period for this site, was determined to be between 2:00 PM and 5:00 PM from July 17 through July 19. ED accepts this method of peak demand estimation. Savings due to interactive effects were not calculated by the IOU reviewer. For UPS unit 3, which had a 20% part-load value, the IOU reviewers chose the efficiency corresponding to the part-load factor of 25%, (thereby setting a floor for the efficiency value).

The reported savings, however, were for the year 2013 (first year savings). ED recommends the use of actual loading from the previous year (2012) for the initial calculation of first year savings since that approach does not entail any uncertainty in savings due to forecasted values. Final savings should be trued-up based on actual post-retrofit load to be measured over a stable operational period. The revised calculations did not utilize the actual baseline efficiencies as described in the “Energy Efficiency Baselines for DATA CENTERS”<sup>1</sup> document. ED revised the savings calculations utilizing the prescribed baseline efficiency values; the ED revisions are shown below.

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<sup>1</sup>[http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/hightech/data\\_center\\_baseline.pdf](http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/hightech/data_center_baseline.pdf)

	<b>As utilized in the IOU Calculations</b>	<b>ED Revised Values<sup>2</sup></b>
<b>Part-Load</b>	<b>kVA &gt; 100</b>	
100%	93.3%	93.8%
75%	93.1%	93.5%
50%	92.2%	93.0%
25%	89.4%	89.8%
20%	89.4%	89.8%

Additionally, the IOU response indicated that the costs for baseline UPS units were unavailable or infeasible to obtain during this phase. ED recommends the IOU provide incremental project cost before this project can be approved. After the measure installation is complete, ED recommends the use of actual operating data - trend data for a period of at least four-to-six weeks that represents stable and typical operation in order to re-calculate the savings that can be frozen.

**Review Conclusion**

The project is not approved until incremental cost estimate has been provided.

**Summary of ED Requested Action by the IOU**

After the project is approved, ED requests that the IOU submit the following once the measure installation and the post-installation data collection activities are completed:

1. Submit revised savings calculations for true-up, and
2. Provide supporting documentation (final invoices) on the project’s actual measure cost estimates.
3. Modify the post-installation verification plan to collect site specific data for a minimum of four-to-six weeks.

**Table 1-2: Project Overview**

<b>Description</b>	<b>IOU Proposed Ex Ante Data</b>	<b>ED Recommendations</b>
<b>Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization,</b>	Normal Replacement	Normal replacement is reasonable; ISP is the appropriate equipment baseline, which is outlined in the “Energy Efficiency

<sup>2</sup>[http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/hightech/data\\_center\\_baseline.pdf](http://www.pge.com/includes/docs/pdfs/mybusiness/energysavingsrebates/incentivesbyindustry/hightech/data_center_baseline.pdf) (p.46)

<b>Description</b>	<b>IOU Proposed Ex Ante Data</b>	<b>ED Recommendations</b>
<b>Add-on Measures)</b>		Baselines for DATA CENTERS” document for 2013 projects.
<b>Project Cost Basis (Full Cost, Incremental Cost)</b>	Full Cost	Incremental costs apply for normal replacement projects
<b>RUL (Early retirement projects only, otherwise N/A (not applicable))</b>	N/A	N/A
<b>EUL</b>	10-12 years (based on manufacturer interviews)	10-12 years.
<b>First Year kWh Savings</b>	223,117 (per the revised calculation spreadsheet)	175,288
<b>First Year Peak kW Savings</b>	25.47 (per the revised calculation spreadsheet)	20.01
<b>First Year Therms Savings</b>	Not provided	TBD; ED would like confirmation that there is no natural gas supplied to heating units at the DC
<b>kWh Savings (RUL Period)</b>	N/A	N/A
<b>Peak kW Savings (RUL Period)</b>	N/A	N/A
<b>Therms Impact (RUL Period)</b>	N/A	N/A
<b>kWh Savings (EUL thru RUL Period)</b>	N/A	N/A
<b>Peak kW Savings (EUL thru RUL Period)</b>	N/A	N/A
<b>Therms Savings (EUL thru RUL Period)</b>	N/A	N/A
<b>Annual Non-IOU Fuel Impact (RUL</b>	N/A	N/A

Description	IOU Proposed Ex Ante Data	ED Recommendations
Period)		
<b>Annual Non-IOU Fuel Impact (EUL thru RUL Period)</b>	N/A	N/A
<b>Net-to-Gross Ratio</b>	Not provided	Not assessed

**Table 1-3: Detailed Review Findings**

Reviewed Parameter	Analysis
<b>Project Gross Savings Baseline</b> (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: Normal Replacement
	ED Assessment: Normal Replacement
	ED Recommendation: None. Baseline UPS system efficiency values as described in the “Energy Efficiency Baselines for DATA CENTERS” will apply.
<b>Project Cost Basis</b> (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Total material cost of \$668,456.63
	ED Assessment: Incremental measure costs will apply.
	ED recommendation: Submit incremental cost estimate.
<b>RUL</b> (required for early retirement projects only, otherwise n/a)	IOU Proposal: N/A
	ED Assessment: N/A
	ED recommendation: N/A
<b>EUL</b>	IOU Proposal: 10-12 years (based on manufacturer interview)
	ED Assessment: Acceptable
	ED Recommendation: 11 years
<b>Savings Assumptions</b>	IOU Proposal: The savings were calculated using the estimated UPS loads (forecasted using trend data for 2007-2012) for the years 2013-2017 and the manufacturer performance specifications.
	ED Assessment: Forecasting of loads introduces uncertainty in the savings estimates. ED policy does not allow final savings to be calculated based on

<b>Reviewed Parameter</b>	<b>Analysis</b>
	forecasted loads.
	ED Recommendation: ED recommends the use of the past year (2012) loading to calculate the project first year savings as a starting point.
<b>Calculation Methods/Tool review</b>	IOU Proposal: The IOU utilized a spreadsheet based approach.
	ED Assessment: The IOU methods appear reasonable.
	ED Recommendation: ED recommends the use of actual post-installation operating data.
<b>Pre- or Post-Installation M&amp;V Plan</b>	IOU Proposal: The IOU intends to perform a post-installation verification.
	ED Assessment: ED approves the IOU/TPI post-installation data collection activities. However, ED recommends the additions (provided below) to the current plan.
	ED Recommendation: Collect actual operating data for a period of at least four-to-six weeks.
<b>Net-to-Gross Review</b>	IOU Proposal: Not provided
	ED Assessment: Not recommended
	ED Recommendation: None