

Ex Ante Review Findings

Project Information

IOU	PG&E
Application ID	2K1153551C
Application Date	6/9/2011
Program ID	
Program Name	PG&E CCC Partnership Program
Program Year	2011
Project ID	
IOU Ex Ante Savings Date	1/12/2012
ED Measure Name	
Project Description	Transformer Replacement
Date of ED Review	2/13/2012
Primary Reviewer and Firm	Keith Rothenberg/Energy Metrics
Review Supervisor and Firm	
Type of Review	Desk Review
ED Recommendation	Not Approved – Additional Information Needed.

IOU Project Description

The project involves the replacement of a 1,000 kVA dry type electric transformer located on a [REDACTED] with a new 1,000 kVA dry type electric transformer. High efficiency transformers have greater conductor cross sectional area which reduces core losses and winding losses.

Summary of Review

The application documentation received includes a project application review dated 1/12/12, a calculation summary in a .pdf file (live spreadsheet not provided), a research paper from Oakridge National Laboratory dated April 1995, email correspondence from a manufacturer with an estimate of the pre-retrofit transformer core and coil losses, a brochure from a manufacturer describing the US Federal Government transformer efficiency standards that went into effect in 2010, and vendor cost proposal for the purchase and delivery of the new transformer; labor and other materials were not included.

The documentation presents a reasonable approach to estimating the impacts of the project. At this point the impacts of the project are based on the new transformer meeting the 2010 minimum efficiency standards, however the final impacts will be estimated based on additional data provided for the new transformer.

The ED review has identified several issues for further investigation concerning this project including the condition of the existing transformer, its remaining useful life, the EUL of the

measure, and the proposed NTG for the measure. Without additional documentation it is not feasible to complete a comprehensive ex ante review at this time.

The Project Application Review claims an annual savings impact of 30,397 kWh, 3.47 kW demand reduction with an incentive amount of \$7,925.

Review Conclusion

Review not completed at this time pending fulfillment of a data request and subsequent opportunity for ED to re-evaluate the savings analyses.

Description	IOU Proposed Ex Ante Data	ED's Recommendations
Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction)	TBD	TBD-more information needed
Project Cost Basis (Full Cost, Incremental Cost)	Full cost	TBD. Need to verify appropriate baseline.
RUL (Early retirement projects only, otherwise n/a)	TBD	TBD
EUL	TBD	TBD
First Year kWh Savings	30,397	TBD
First Year Peak kW Reduction	3.47	TBD
First Year Therms Savings	0	0
Total kWh Savings (RUL Period)	TBD	TBD
Total Peak kW Reduction (RUL Period)	TBD	TBD
Therms Impact (RUL Period)	TBD	TBD
Total kWh Savings (EUL – RUL Period)	TBD	TBD
Total Peak kW Reduction (EUL – RUL Period)	TBD	TBD
Total Therms Savings (EUL – RUL Period)	0	0
Total non-IOU Fuel Impact (RUL Period)	NA	NA
Total non-IOU fuel Impact (EUL – RUL	NA	NA

Description	IOU Proposed Ex Ante Data	ED's Recommendations
Period)		
Net-to-Gross Ratio	Not stated	Not addressed

Detailed Review Findings

Reviewed Parameter	Analysis
Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: In situ.
	ED Assessment: The IOU needs to provide a baseline proposal and supporting information.
	ED Recommendation: More information required concerning the circumstances related to the replacement of the transformer, pending baseline verification.
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Total cost
	ED Assessment: Total cost may not be appropriate pending verification of the proper baseline.
	ED recommendation: More information required, pending verification.
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: Not stated.
	ED Assessment: More information required.
	ED Recommendation: More information required, pending verification, IOU to provide RUL and a description of the condition of the pre-retrofit transformer.
EUL	IOU Proposal: TBD, not identified in documentation received.
	ED Assessment: TBD
	ED Recommendation: Request proposed EUL from IOU.
Savings Assumptions	<p>IOU Proposal: ED has reviewed calculations submitted for this project dated 1/12/12. The baseline transformer losses are derived from data received from a manufacturer estimating the core (no load) loss to be 4.03 kW, and the coil (load) loss to be 19.96 kW at full load. The data appear to be "typical" - estimated by the manufacturer for the transformer winding type. The documentation states that the load (kW) on the transformer's secondary side was measured for 7 days. The transformer was found to be approximately 8% loaded on average over that period.</p> <p>The documentation includes a paper form Oakridge National Laboratory dated April 1995 that discusses transformer replacement projects and provides a formula for calculating the transformer efficiency based on the transformer load (kW), core loss (kW), coil loss (kW), and transformer capacity (kW).</p>

Reviewed Parameter	Analysis
	<p>The proposed transformer efficiency is based on a manufacturer's brochure that discusses the New US Federal Government efficiency standards for transformers that went into effect on 1/1/2010. The calculations assume that the new transformer will meet the minimum efficiency standard.</p> <p>The reviewer's application review comments note that test data for the new transformer core and coil losses are required to be submitted to the IOU for review, and that the ex ante savings may be modified based on that data.</p> <p>ED Assessment: This is a reasonable approach to estimating the ex ante impacts for this project. The coil (load) losses are insignificant since the transformer is lightly loaded. More information about the pre-retrofit transformer age and condition need to be provided to determine if the IOU baseline selection is appropriate. Need to calculate impacts for EUL-RUL period, if appropriate.</p> <p>ED Recommendation: TBD pending verification of baseline condition and final core and coil loss data for the actual installed transformer.</p>
<p>Calculation Methods/Tool review</p>	<p>IOU Proposal: Spreadsheet analysis.</p> <p>ED Assessment: Spreadsheet analysis is appropriate.</p> <p>ED Recommendation: Approved.</p>
<p>Pre- or Post-Installation M&V Plan</p>	<p>IOU Proposal: Load on existing transformer secondary measured for 7 days. Test data for the new transformer core and coil losses is required, the ex ante savings may be modified based on that data.</p> <p>ED Assessment: Reasonable approach, verify that the baseline selection is appropriate,</p> <p>ED Recommendation: Approved</p>
<p>Net-to-Gross Review</p>	<p>IOU Proposal: None</p> <p>ED Assessment: Not addressed</p> <p>ED Recommendation: None</p>