Phase I Ex Ante Review Findings

Table 1-1: Project Information

IOU	PG&E
Application ID	REEP-087
Application Date	11/12/2012
Program ID	PGE2225
Program Name	Refinery Energy Efficiency Program
Program Year	2012
Itron Project ID	X330
IOU Ex Ante Savings Date	TBD
ED Measure Name	Boiler Blowdown Controls
Project Description	Install new, automatic blowdown controls on three (3) boilers
Date of ED Review(s)	04/25/2013
Primary Reviewer and Firm	Kumar Chittory/ERS
Review Supervisor and Firm	Joseph Ball /Itron
ED Project Manager	[redacted] / California Public Utilities Commission, Energy Division
ED Policy Authorization	
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	Ex ante savings estimates are conditionally approved pending reception & review of post-installation M&V data and savings true-up

Measure Description

This project involves conversion of manual boiler blowdown to automated blowdown for three (3) boilers at the facility. Water used for the steam boilers is a capable solvent and contains minor amounts of impurities. The evaporation of steam concentrates dissolved impurities until they reach unacceptable concentrations. The high concentration of impurities causes scale and/or corrosion which potentially damage the boiler. To mitigate the potential damage, the concentrated impurities are removed by boiler blowdown. The proposed automated boiler blowdown will continuously monitor the level of blowdown water conductivity, and only blowdown the necessary amount of water, thus it protects the boiler while saving blow down water and energy. Therm savings for this project are estimated at 406,966 therms. The total project cost is currently estimated at $285,000. An incentive of $142,500 is claimed based on the estimated therm savings.

Summary of Review

The Investor Owned Utility (IOU) submitted the following documents for review:

- Project participation agreement "REEP 087 PPA XXXX Boiler Blowdown.doc",
- Calculation spreadsheet "REEP 087 PPA [redacted] Boiler Blowdown Calculation",
- Executive Summary "REEP 087 PPA Title Page.doc"

IOU provided the equations and assumptions behind the savings calculations in the implementation plan. Those equations and one year trended data were used in the savings calculation spreadsheet to estimate the therm savings. ED reviewed the savings calculation for this project and agrees with the overall approach and most of the assumptions behind the calculations.

ED would like clarification for the proposed average conductivity of 4,800 µS that was used in the calculations. The basis behind this value is not listed in the documentation. ED would like to know the reasoning behind the proposed average conductivity of 4,800 µS.

Secondly, the documentation does not provide any information on the operating hours of the three boilers. Does the facility run all the three boilers in parallel or do they use some of the boilers as back-up?

The implementation plan includes the measurement and verification (M&V) plan for this measure. The M&V plan will include collecting hourly data for the same parameters that were provided in the baseline for a period of one month. ED is in agreement with the IOU proposed M&V plan. The post-installation kWh savings are subject to post-installation M&V true-up.

Review Conclusion

Based on the review, ED conditionally approves the energy savings for this project. ED will review the trued-up savings estimates after the post-installation M&V work is completed for final ED review.

Summary of ED Requested Action by the IOU

In order to complete an ex ante review the ED recommends that the IOU submit the following documentation after the post-install inspection & M&V true has taken place:

- EUL of the proposed measure.
- Detailed, itemized invoices and any other pertinent documentation used to verify the project's actual measure cost
- The post-installation M&V data and trued-up savings estimates
- Update the savings calculation spreadsheet if there are negative electric impacts because of the new controls.

Table 1-1: 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)	Add-on measure	Add-on measure
Project Cost Basis (Full Cost, Incremental Cost)	Full cost : $285,000	Full cost basis is appropriate
RUL (Early retirement projects only, otherwise N/A (not applicable))	Not provided	N/A
EUL	Not provided	TBD
First Year kWh Savings	0	TBD
First Year Peak kW Savings	0	TBD
First Year Therms Savings	406,966	TBD
kWh Savings (RUL Period)	0	N/A
Peak kW Savings (RUL Period)	0	N/A
Therms Impact (RUL Period)	406,966	TBD
kWh Savings (EUL thru RUL Period)	0	TBD
Peak kW Savings (EUL thru RUL Period)	0	TBD
Therms Savings (EUL thru RUL Period)	0	TBD
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	N/A	N/A
Net-to-Gross Ratio	Not provided	TBD

Table 1-2: Detailed Review Findings

Reviewed Parameter	Analysis
Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: Add on measure
	ED Assessment: Add on measure
	ED Recommendation: Acceptable
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Full cost provided.
	ED Assessment: Full cost basis is acceptable.
	ED recommendation: ED requests that the IOU provide detailed, itemized invoices and any other pertinent supporting documentation used to verify the project's actual measure cost estimates upon project completion.
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: N/A
	ED Assessment: N/A
	ED recommendation: N/A
EUL	IOU Proposal: Not provided.
	ED Assessment: Use the EUL from the DEER database for controls measure.
	ED Recommendation: Use the EUL from the DEER database
Savings Assumptions	IOU Proposal: IOU estimates the therm savings by calculating the difference between the baseline and proposed annual natural gas blowdown. Baseline annual boiler blowdown natural gas consumption is estimated using basic thermodynamic equations and one year trend data.
	ED Assessment: Proposed annual natural gas blowdown is estimated based on assumed average conductivity of 4,800 µS. The reasoning behind the use of this number is not clear from the documentation. Also, the documentation does not provide any information about the age, condition and RUL of the existing boilers.
	ED Recommendation: ED agrees with the current value as a place holder and recommends that this number should be updated based on the post-installation metered data.
Calculation	IOU Proposal: Calculations were performed in excel spreadsheet based on the

Reviewed Parameter	Analysis
Methods/Tool review	equations and assumptions noted in the implementation plan.
	ED Assessment: ED agrees with the calculation methodology.
	ED Recommendation: None
Pre- or Post-Installation M&V Plan	IOU Proposal: Detailed M&V plan is provided as part of the implementation plan.
	ED Assessment: ED agrees with the proposed M&V plan.
	ED Recommendation: None.
Net-to-Gross Review	IOU Proposal: Not provided.
	ED Assessment: None at this time.
	ED Recommendation: TBD.