

Phase II Ex Ante Review Findings

Table 1-1: Project Information

IOU	PGE
Application ID	1773
Application Date	11/29/2012
Program ID	PGE2222
Program Name	Energy Efficiency Services for Oil Production
Program Year	2012
Itron Project ID	X274
IOU Ex Ante Savings Date	11/29/2012
ED Measure Name	New Steam Generator
Project Description	The project entails installing 2 measures: 1) VFDs on new steam generator feedwater pump and combustion air fan, and 2) a split pass design of the steam generator in lieu of the standard single pass configuration.
Date of ED Review(s)	2/1/2013 & 4/3/2013
Primary Reviewer and Firm	Kunal Desai/Itron
Review Supervisor and Firm	Joseph Ball/Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review
ED Recommendation	The ex ante project PGE 1773 is approved, energy savings are subject to post M&V true up

Measure Description

The project consists of two energy savings measures. The first measure is to install an efficient split pass design in the new steam generator over the standard single pass configuration. The second measure is to install two (2) VFDs, one (1) on a new 300 HP steam generator feedwater pump and one (1) on a 150 HP combustion air fan motor.

Summary of Review

Pacific Gas & Electric (PG&E) submitted the following documents to the Energy Division (ED) for the Phase II review process:

- A word documents containing response to Phase I data request,
- Breakdown of project cost,
- Revised Energy Savings Calculation spreadsheet,
- Equipment specification
- ABB software's energy savings calculation for the combustion fan.

Phase I data response from third party contactor indicated that PG&E had advised them to include energy savings until year 5 with a forecasting method. On ED's suggestion the third party implementer resubmitted the energy savings calculation with projection of the first year savings only. IOU clarified that the customer has no other wells at the same site that have a similar split pass design steam generator installed. ED assumes that the new steam generator will be serving a new well. Submittals for new pump and fan were submitted for ED review, although the submittal for the new split pass steam generator was not submitted. ED suggests that submittal for the new split pass steam generator is submitted for ED review. IOU assumed that the feedwater pump will be in operation for 5151 hrs/year. Data supporting this assumption should be provided in the post M&V phase. Post Installation M&V plan was not submitted by the IOU. ED has listed M&V plan suggestions for the IOU to include in the report below. IOU should incorporate these recommendations and submit a draft of M&V plan prior to post installation M&V efforts.

The revised preliminary estimates provided by the IOU with projections of year 1 savings are 582,569 KWh and 67.86 kW. The breakdown of energy savings by measure is as follows; Feedwater pump VSD amounted to 185,653 kWh, Combustion air fan VSD savings amounted to 82,769 kWh and split pass steam generator design amounted to 314,147 kWh. The peak kW calculations should reflect DEER peak and not average peak. IOU should revise the kW savings in the post installation true up. The preliminary project cost and incentive is estimated to be \$165,000 and \$59,217 respectively.

Review Conclusion

The ex ante project PGE 1773 is approved, energy savings are subject to post M&V true up

Summary of ED Requested Action by the IOU

ED recommends that the IOU perform the following action:

1. Submit M&V plan for ED review prior to post-installation inspection

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)	New Construction	New Construction
Project Cost Basis (Full Cost, Incremental Cost)	Incremental Cost	Incremental cost provided. Provide post installation invoices with breakdown of equipment + labor costs, for the proposed and baseline equipment when available.
RUL (Early retirement projects only, otherwise N/A (not applicable))	N/A	N/A
EUL	Not Provided	VFDs on pumps and fan motors is 15 years; design layout configuration measure will need further assessment
First Year kWh Savings	582,569	TBD
First Year Peak kW Savings	67.86	TBD
First Year Therms Savings	N/A	N/A
kWh Savings (RUL Period)	N/A	N/A
Peak kW Savings (RUL Period)	N/A	N/A
Therms Impact (RUL Period)	N/A	N/A
kWh Savings (EUL thru RUL Period)	582,569	TBD
Peak kW Savings (EUL thru RUL Period)	67.86	TBD
Therms Savings (EUL thru RUL Period)	N/A	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	A NTG interview might be warranted

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: New Construction
	ED Assessment: New Construction
	ED Recommendation: None
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: Incremental cost
	ED Assessment: Increment cost provided. The single pass heat exchanger was priced at \$1,664,235. The dual pass heat exchanger with VFD on feedwater pump and combustion fan is priced at \$1,716,254.
	ED recommendation: Provide post installation invoices with breakdown of equipment + labor costs, for the proposed and baseline equipment when available.
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: VFDs on pumps and fan motors is 15 years; design layout configuration measure will need further assessment
	ED Recommendation: TBD
Savings Assumptions	IOU Proposal: A “live” energy savings calculation spreadsheet. IOU assumed that the operating hours for the steam generator feedwater pump will be 5151 hrs/ year. IOU has also assumed that the average VFD speed will be 45 Hz. For the Combustion air fan savings, IOU assumed fan efficiency and the capacity to be at 83% and 75% respectively. In the split pass design calculations, IOU assumed the exit pressure will be 1500 psi. Flow rate (pump & steam), along with the pipe diameter was also assumed by the IOU.
	ED Assessment: IOU expects the plant will operate for 5,151 hours in the first year. All other savings assumption used by the IOU needs to be verified in the post installation M&V.
	ED Recommendation: ED suggests that IOU include all the above mentioned parameters in the M&V plan.
Calculation Methods/Tool review	IOU Proposal: A live energy savings calculation spreadsheet was provided for ED review.
	ED Assessment: On ED’s recommendation, IOU revised the calculation and submitted savings for the first year only. The forecasting method was not used

Reviewed Parameter	Analysis
	in the revised calculation methodology.
	ED Recommendation: None
Pre- or Post-Installation M&V Plan	IOU Proposal: M&V plan not provided for ED review.
	ED Assessment: Not assessed
	<p>ED Recommendation: Submit M&V plan for ED review. The M&V plan should be drafted to include the following;</p> <p>Logger data or SCADA data needs to verify plant operating hours. M&V plan should plan to either log the VFD speed of the pump and the combustion fan.</p> <p>Loggers should be set up to monitor voltage, current draw from the combustion air fan to verify fan efficiency and capacity.</p> <p>In the split pass steam generator design post installation M&V, IOU should log the exit pressure at the steam generator. Flow rate (pump & steam) should also be monitored either with a logger or using SCADA data. Pipe diameter should be verified from the construction submittals and should be submitted for post installation ED review.</p> <p>The time period for the post installation M&V should be a minimum of 1 month. Logger/SCADA trends along with the post installation energy savings calculation should be submitted for ED review.</p>
Net-to-Gross Review	IOU Proposal: Not provided
	ED Assessment: Not assessed
	ED Recommendation: NTG interview will be conducted.