Ex Ante Review Findings

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

IOU	Pacific Gas & Electric
Application ID	1797
Application Date	7/30/2012
Program ID	PGE2222
Program Name	Energy Efficiency Services for Oil Production
Program Year	2012
Itron Project ID	X220
IOU Ex Ante Savings Date	TBD
ED Measure Name	VSD Retrofit
Project Description	Install new Long Stroke Rotaflex pumping units with VSDs
Date of ED Review(s)	11/26/2012
Primary Reviewer and Firm	Kumar Chittory/Itron
Review Supervisor and Firm	Joseph Ball/Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review
ED Recommendation	ED conditionally approves PGE project 1797 with post installation M&V data and savings true up. Ex ante savings calculation will need to be resubmitted with revised baseline for ED review.

Measure Description

Measure involves installing ten (10) new to Rotaflex long stroke pumping units with variable speed drives (VSDs) for oil extraction, in lieu of conventional, uncontrolled standard rod beam pumps.

Summary of Review

The IOU submitted the following documents for this initial ex ante review:

- Project Description Report,
- Calculations contained in an Excel Workbook, and
- Signed Agreement document

The project involves installing a Rotaflex long stroke pumping unit with a variable speed drive (VSD) on ten new wells. The long stroke of the Rotaflex gives greater displacement per stroke than a conventional rod beam pump which allows the Rotaflex to operate at a slower speed to achieve the same production as the baseline rod beam pump. The difference in energy consumption will result in kWh savings. The Rotaflex is equipped with a VSD and it will control the speed of the pump to match the dynamic flow conditions of the well to optimize energy consumption and production.

The calculation spreadsheet estimates the total system efficiency of the baseline unit at 45% and it estimates 60% total system efficiency for the Rotaflex long stroke pumping unit from an SPE paper (37499). The IOU claims that the baseline for this measure is an uncontrolled rod-beam pump that operates 24 hours per day year round. Since these are new wells and rod-beam pumps with Pump of Controllers (POCs) are standard practice for this customer, ED recommends that the baseline for this measure should be changed to rod beam pump with POC. SPE tool can also be used to estimate energy usage of the baseline rod beam pump with a POC for a pre installation energy usage estimate. As recommended in ED's 2006-2008 evaluation, post installation true-up should be performed using daily or monthly production records (as available) collected from the facility's SCADA system to determine pump operation with POC's for verification. The annual operating hours are estimated at 8,585 hours to account for well maintenance and repairs. From ED's '06-08 impact evaluation including 139 wells at this customer site, a sample of 14 sites were analyzed using onsite SCADA that determined the average annual post-install runtime to be 58.8%, 5151 hours/yr. Load factor for the same sites were determined to be at 32.6% and could be used for the baseline calculations in the revised spreadsheet. The total project cost is currently estimated at $1,500,000 and they will be validated by reviewing the invoices during the post-installation verification. For this project, an incentive of $71,964 is claimed based on the estimated demand and energy savings. ED accepts with IOU approach of using 60% total system efficiency to calculate the post-installation kWh subject to post-installation M&V true-up.

Review Conclusion

ED conditionally approves PGE project 1797, however, ex ante savings calculations will need to be resubmitted for ED review with revised baseline. Additionally, 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

ED requests that the IOU submit the following once the measure installation and the post-installation measurements are completed:

1. Provide the updated savings calculation spreadsheet with modified baseline. Since these are new wells and rod-beam pumps with POCs are standard practice for this customer, ED recommends that the baseline for this measure should be changed to rod-beam pump with POCs. Use annual operating hours of 5151 for the baseline estimate wells.
2. Provide M&V plan for ED review.
3. Submit the post-installation M&V data and trued-up savings estimates, when available.
4. Provide detailed, itemized invoices and any other pertinent documentation used to determine the project's actual measure cost estimates, when available.

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 with equipment baseline as an uncontrolled standard rod beam pump	New Construction with equipment baseline as a standard rod beam pump with pump off controller (POC)
Project Cost Basis (Full Cost, Incremental Cost)	Full cost - $1,500,000 Incremental cost estimated at $120,000 per well.	TBD; ED recommends that the IOU submit the actual installed measure costs and incremental cost be estimated as the difference between the baseline POC and the VSD measure cost.
RUL (Early retirement projects only, otherwise N/A (not applicable))	N/A	N/A
EUL	Not provided	TBD
First Year kWh Savings	711,788 kWh as per IOU's calculation spreadsheet.	TBD; pending post-retrofit true-up and baseline adjustment
First Year Peak kW Savings	79.03 kW as per IOU's calculation spreadsheet.	TBD; pending post-retrofit true-up and baseline adjustment
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)	N/A	N/A

Description	IOU Proposed Ex Ante Data	ED Recommendations
Peak kW Savings (EUL thru RUL Period)	N/A	N/A
Therms Savings (EUL thru RUL Period)	N/A	N/A
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 1-3: Detailed Review Findings

Reviewed Parameter	Analysis
Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: New Construction baseline; rod beam pump uncontrolled using as baseline in ex ante documents.
	ED Assessment: New Construction baseline acceptable. Uncontrolled equipment baseline not acceptable. POCs on rod beam pumps are standard practice for this customer.
	ED Recommendation: Revise baseline equipment to Rod beam pump with pump of controller for controls.
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: $1,500,000 Incremental cost estimated at $120,000 per well
	ED Assessment: Incremental cost should represent the differential between the POC and VSD cost.
	ED recommendation: ED recommends that the IOU submit the actual installed measure costs
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: TBD
	ED Recommendation: TBD
Savings Assumptions	IOU Proposal: The total system efficiency for the baseline rod beam pumping unit is estimated at 45% in the savings calculation spreadsheet. The oil well rod beam pumps are assumed to run continuously with only 2% downtime for maintenance yielding an annual runtime of 8,585 hours. Equipment baseline used is rod beam pumps with no controls
	ED Assessment: Equipment baseline not consistent with customer or industry standard practice. From previous evaluations at this customer site, ED determined that the average rod beam pump runtime was 5151 hours/yr.
	ED Recommendation: Revise equipment baseline to rod beam pumps with POCs. Use 5151 annual operating hours for baseline estimates.

Reviewed Parameter	Analysis
Calculation Methods/Tool review	IOU Proposal: Custom energy savings calculation spreadsheet submitted.
	ED Assessment: Equipment baseline not consistent with Industry standard practice
	ED Recommendation: Revise equipment baseline to rod beam pumps with Pump off controllers. no changes
Pre- or Post-Installation M&V Plan	IOU Proposal: No M&V plan provided
	ED Assessment: Not Accessed
	ED Recommendation: Provide M&V plan for ED review
Net-to-Gross Review	IOU Proposal: Not provided
	ED Assessment: None at this time
	ED Recommendation: TBD