Final Ex Ante Review Findings

Table 1-1: Project Information

IOU	PG&E
Application ID	A-1-W-2811
Application Date	8/6/2013
Program ID	PGE21035
Program Name	Agricultural Pumping Efficiency Program
Program Year	2013
Itron Project ID	X431
IOU Ex Ante Savings Date	7/24/2013
Measure Name	Ag Pumping
Project Description	Replace agricultural well pump and bowl
Date of CPUC Staff Review(s)	02/25/2014
Primary Reviewer / Firm	Charles Ehrlich / Itron
Review Supervisor / Firm	Joseph Ball / Itron
CPUC Staff Project Manager	[redacted] / California Public Utilities Commission, Energy Division
CPUC Staff Policy Authorization (as needed)	TBD
Type of Review (Desk, On-site, Full M&V, Tool)	Desk Review
CPUC Staff Recommendation	PG&E provided a sufficient response to data requests and followed most guidance in the Phase I EAR, therefore savings of 16,173 kWh and 1.79 kW are approved. This final EAR contains additional requirements for documenting peak kW impacts for ag well pump projects and other guidance for any new program which may replace the current APEP or similar ongoing programs.

Measure Description

The project is the repair of a 25 hp agricultural well pump at a citrus farm in the central valley (CZ13) involving the replacement of the impeller and bowl. The pump motor had been rewound 2 months prior to the replacement of the impeller and bowl. Water is drawn from the well and delivered to the orchard using two pumps; the second pump is a 15 hp pump that was not altered during this project.

Although not identified as a specific action required of PG&E in the Phase I EAR, the CPUC Review staff finds that the documentation for this project, and the methods used by the program in general, are insufficient to support the peak kW demand reduction claims. Considering the very small kW demand reduction of this project and other evidence that does not disprove the claimed peak kW demand impacts, **this project** savings are approved, but this approval is not intended to be precedent setting for the method used to calculate peak demand savings.

Summary of Review

PG&E submitted the following documents to CMPA for this final review:

- Narrative Response to ED Phase I Disposition date 10/25/2013
- Final Project Application package dated 2/15/2014
- Invoices from the pump retrofit company dated 7/16/2013
- Pre-Project Pump Efficiency Test report dated 11/22/2011
- Post-Project Pump Efficiency Test report dated 10/18/2013

The CPUC review staff assessed the final application documentation. The pump post-installation test confirms kWh savings and the narrative description summarizing the conference call with program implementation staff addresses the questions related to the certification of the pump testing companies. However, the documentation of peak kW demand reduction is inadequate.

To address this shortcoming, CPUC review staff obtained the monthly billing history going back to 2009. Due to time constraints, interval usage data was not reviewed, but monthly usage shows average peak demand of 32.5 kW in August of each of the four years of billing history which implies a minimum of 26 days of use during the month of August assuming 21 kW pump average demand. The operation of the pump during the peak demand period could not be verified with the available documentation.

Future programs addressing the agricultural well pump market must include a review of interval meter data, when available, to verify that the pump has previously been in operation during the prior peak demand reduction period(s). Also, PG&E should require that program implementers collect data from the well pump site on the existence of timers or other IOU-controlled disconnect devices which are intended to prevent the pump from operating during peak demand periods and disallow those projects from claiming peak kW demand reduction. Please see the

Phase I EAR for more information and detailed recommendations on the baseline and savings calculation method.

Review Conclusion

The final approved ex ante savings are 16,173 kWh and 1.79 kW. Approval of peak demand reduction is not intended to be precedent setting. Please review the additional guidance below.

Summary of CPUC Staff Requested Action by the IOU

CPUC staff requests that the IOU undertake the following recommended steps as essential for improving the accuracy of savings estimates in the APEP or successor programs.

1. Annotate pump test paperwork to indicate if the pump is controlled with either a timer or an interrupt device which is scheduled or designed to prevent the pump from operating during the CPUC defined peak demand time period.
2. Review 15-minute interval demand data, when available, from the billing meter to verify that the pump has operated during the previous CPUC peak demand reduction period applicable for the climate zone in which the pump is located. If not shown to be operational during these time periods, then set peak kW reduction claim to 0 kW.
3. Review the Phase I recommendations and incorporate them into future program implementation rules and guidelines, specifically those recommendations related to the timing of the pump pre-tests and the calculation methods.

In short, PG&E should revise their pump test report procedures to explicitly verify that the pump has operated during the peak demand period before estimating a peak demand reduction. Pump tests older than one year are generally going to under-estimate the savings because the pump equipment continues to degrade, however; changes in site conditions such as the addition of a timer would over-estimate demand reduction. The CPUC staff review team believes that the failure to implement these revisions may leave a potentially widespread systematic error in the claimed savings of all similar projects for peak demand reduction.

Table 1-2 Review Findings

Reviewed Parameter	Analysis
Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization,	IOU Proposal: Retrofit Add-on (REA)
	CPUC Staff Assessment: RCx or System Optimization
	CPUC Staff Recommendation: The pump overhaul measure entails various improvements and repairs. CPUC staff notes that impeller and bowl replacements are considered like-for-like replacements under CPUC Policy.

Table 1-2 Review Findings

Reviewed Parameter	Analysis
Add-on Measures, Major Renovation) Note: For early retirement projects only, include RUL through EUL baseline)	The Policy and Procedures Manual for this program allows agricultural pump repairs. This is inconsistent with statewide policy. Until further details are furnished upon the implementation of the new program, CPUC staff will consider this either an RCx or System Optimization type measure.
Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)	IOU Proposal: In situ pump operating schedule and degraded pumping efficiency based upon a pre-test no more than two years prior to the project.
	CPUC Staff Assessment: In situ is acceptable as an RCx or System Optimization project.
	CPUC Staff Recommendation: The baseline for peak demand reduction needs to be calculated based upon the pre-existing controls and the actual rate tariff or the site-specific interval billing history.
Project Cost Basis (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment)	IOU Proposal: 50% of full measure cost of $10,205.70. Incentive of $542.87 is capped at 50% of eligible costs
	CPUC Staff Assessment: acceptable
	CPUC Staff Recommendation: Project costs are supported with dated invoices and generally include only eligible costs, i.e., the pump rewind cost is not included. Statewide CPUC policy requires documentation of project costs to support total and/or incremental measure costs. In addition, invoices serve to support the date the project was implemented.
RUL (required for early retirement projects only, otherwise N/A)	IOU Proposal: N/A
	CPUC Staff Assessment: N/A
	CPUC Staff Recommendation: None.
EUL (for each measure)	IOU Proposal: 5 years for ag pump system overhaul
	CPUC Staff Assessment: Application documentation of a recent major repair (motor rewind) suggests that this pump will continue to operate and be maintained in working order for the near future. The DEER does not provide EUL for this measure. RCx measures typically claim slightly longer EULs. Hence, CPUC Review Staff considers the PG&E value acceptable at this time.
	CPUC Staff Recommendation: The frequency of pump repairs should be further explored. In the interim, a 5 year EUL is acceptable.
Savings Assumptions	IOU Proposal: Improvement in pumping operating efficiency, assumed to be 25% of current annual energy usage.
	CPUC Staff Assessment: The increase in operating efficiency is reasonable. The program procedures do not appear to verify the actual on-peak demand in the billing history and did not state if pre-existing pump controls were present. CPUC Review Staff verified with monthly billing from 2009 through 2013,

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	that demand and energy use for this pump is likely to occur during the CPUC peak period.
	CPUC Staff Recommendation: For this project, the claimed peak demand reduction is acceptable. The post-implementation pump test results serve to true-up the energy savings claim based on measurement.
Calculation Methods/Tool review	IOU Proposal: PG&E used their online pump test tool to estimate ex ante savings.
	CPUC Staff Assessment: The following is general guidance, not necessarily relevant to this specific project. When the overall pump efficiency (OPE) cannot be determined from the pump test, a combination of utility bill usage history and assumed post-project OPE are used. The PG&E peak demand reduction calculation procedure does not take the pre-existing controls and rate tariff into consideration and ignores the fact that pump usage on TOU rate tariffs are likely to be shifted to the non-peak periods.
	CPUC Staff Recommendation: PG&E should revise their project review procedures to verify the peak demand usage using available historical billing demand data and operating efficiency improvements based on documented project results.
Pre- or Post-Installation M&V Plan	IOU Proposal: Pre- and post-implementation pump tests
	CPUC Staff Assessment: Acceptable for this project
	CPUC Staff Recommendation: None.
Net-to-Gross Review	IOU Proposal: Not provided
	CPUC Staff Assessment: An NTG interview was not conducted
	CPUC Staff Recommendation: None

Table 1-3 Energy Savings Summary, Project Costs & Incentive

Description	IOU Ex Ante Claim	CPUC Staff Recommendations
First Year kWh Savings	16,173.0	16,173.0
First Year Peak kW Savings	1.79	1.79
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 (RUL thru EUL Period)	16,173.0	16,173.0
Peak kW Savings (RUL thru EUL Period)	1.79	1.79
Therms Savings (RUL thru EUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (RUL Period)	N/A	N/A
Annual Non-IOU Fuel Impact (RUL thru EUL Period)	N/A	N/A
Project Costs for Baseline #1 (RUL or EUL)	Eligible Project Cost $10,205.70	Full Measure Costs $10,205.70
Project Costs for Baseline #2 (EUL minus RUL period)	N/A	N/A
Project Incentive Amount	$542.87	$542.87 Incentive capped at 50% of the eligible costs.