

Phase I Ex Ante Review Findings

Table 1-1: Project Information

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|-----------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | |
| IOU | PGE |
| Application ID | 1445-13-1436 |
| Application Date | 5/24/2013 |
| Program ID | PGE |
| Program Name | Oil and Gas Production Energy Efficiency Program |
| Program Year | 2012 |
| Itron Project ID | X364 |
| IOU Ex Ante Savings Date | TBD |
| 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) | 07/01/2013 |
| Primary Reviewer / Firm | Kunal Desai / Itron |
| Review Supervisor / Firm | Joseph Ball / Itron |
| ED Project Manager | ██████████ / California Public Utilities Commission, Energy Division |
| ED Policy Authorization (as needed) | TBD |
| Type of Review (Desk, On-site, Full M&V, Tool) | Desk |
| ED Recommendation | Savings not approved, pending submittal of further requested documentation described in this review |

Measure Description

The project consists of two energy-saving measures on a new 85 MMBTU/HR steam generator. 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 250 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 I review process:

- Project Application,
- Third party implementer's project report,
- Live Energy Savings Calculations spreadsheet,

PG&E is claiming energy savings from installation of a new split pass design steam generator. This steam generator will be servicing a number of steam injection wells. In the split pass design, the feedwater is branched into two pipes downstream of the feedwater pump in order to increase heat transfer and reduce pressure losses through the generator, thereby improving efficiency. PG&E has not submitted cut-sheets or submittals of split pass steam generator design for ED review. The baseline method for pumping is to use a recirculation valve to modify the flow rate from the positive displacement pump. A VFD is expected to save energy when the system is not running at full capacity. This is a new steam generator so IOU is estimating that the steam generator will approximately run 75% of the time. This amounts to 6,570 hours per year. Gradually the operation is projected to increase to 8,585 (98%) hours by year 5. PG&E's calculation methodology uses a forecasting method to estimate total kWh savings until year 5. CPUC energy manual does not permit forecasting. ED suggests that PG&E revise and submit energy savings kW & kWh estimates to account for only first year savings. The preliminary annual kW & kWh energy savings estimates using the forecasting method are 84.61 and 726,374, respectively. Likewise, the preliminary project cost and incentive is estimated to be \$200,000 and \$73,832 respectively.

Review Conclusion

Energy savings are not approved, pending fulfillment of requested data and revisions to the savings analyses.

Summary of ED Requested Action by the IOU

ED requests and recommends that in order to complete an ex ante review the ED recommends that the IOU perform the following action:

1. Provide cut-sheets or equipment specifications for the new steam generator and feedwater system schematic or layout that includes all equipment (combustion air fan, associated motors and VFDs) included in the energy efficiency measures for this project.

2. Provide the total number of steam generators operating at this facility. Identify the number of steam generators from the total which have a split pass flow configuration installed. Please provide quantity and vintage for each of those wells.
3. Provide the total number of existing steam generators that are operating without a split pass flow and the number of steam generators which are operating with a bypass valve at this facility.
4. CPUC energy manual does not permit forecasting. Revise and submit energy savings kW & kWh estimates to account for only first year savings. Submit ABB's assumption of the power exponent used in the affinity law. Provide the locations at this site where baseline flow valves have been used for ED's inspection.
5. Clarify the post-install M&V time period for which the IOU intends to perform data logging.

Table 1-2 Review Findings

| Reviewed Parameter | Analysis |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures) Note: For early retirement projects only, include RUL through EUL baseline) | IOU Proposal: New Construction |
| | ED Assessment: New Construction |
| | ED Recommendation: None |
| Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP) | IOU Proposal: Industry standard practice, single pass design without VFDs on feedwater pumps and combustion fans |
| | ED Assessment: Industry standard practice |
| | ED recommendation: TBD |
| Project Cost Basis (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment) | IOU Proposal: Incremental cost |
| | ED Assessment: Increment cost |
| | ED recommendation: Provide estimated breakdown of equipment + labor costs, for the proposed and baseline equipment. |
| RUL (required for early retirement projects only, otherwise N/A) | IOU Proposal: N/A |
| | ED Assessment: N/A |
| | ED recommendation: N/A |
| EUL (for each measure) | 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: IOU expects the plant will operate for 6,570 hours in the first year |
| | ED Assessment: Exit pressure and DP values need to be verified using on-site SCADA data during the post-install M&V period. |
| | ED Recommendation: The IOU expects the plant will operate for 6,570 hours in the first year. Pump efficiency, operating pressure, GPM, motor & drive efficiencies need to be verified during the post M&V period |
| Calculation | IOU Proposal: A live energy savings calculation spreadsheet was provided |

| Reviewed Parameter | Analysis |
|-----------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Methods/Tool review | for ED review. |
| | ED Assessment: IOU has used forecasting method until year 5 to estimate energy savings. |
| | ED Recommendation: Revise kW and kWh calculations to include energy savings through the end of year 1 only. |
| Pre- or Post-Installation M&V Plan | IOU Proposal: IOU plan has been submitted |
| | ED Assessment: Post M&V time period is not mentioned in the plan |
| | ED Recommendation: Provide the proposed post M&V time period for data logging. |
| Net-to-Gross Review | IOU Proposal: Not provided |
| | ED Assessment: Not accessed |
| | ED Recommendation: TBD |

Table 1-3 Energy Savings Summary

| Description | IOU Ex Ante Claim | ED Recommendations |
|---------------------------------------------------------|-------------------|--------------------|
| First Year kWh Savings | 726,374 | N/A |
| First Year Peak kW Savings | 84.61 | TBD |
| First Year Therms Savings | N/A | TBD |
| 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) | 84.61 | TBD |
| Peak kWh Savings (RUL thru EUL Period) | 726,374 | TBD |
| 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 |