Phase I Ex Ante Review Findings

Table 1-1: Project Information

IOU	PG&E
Application ID	NC0127606
Application Date	Not provided
Program ID	PGE21042
Program Name	Savings by Design
Program Year	2013
Itron Project ID	X436
IOU Ex Ante Savings Date	6/26/2014
Measure Name	Install mechanical vapor re-compressor (MVR)
Project Description	Install mechanical vapor re-compressor (MVR) to recover waste heat and increase production capacity.
Date of CPUC Staff Review	7/2/2014
Primary Reviewer / Firm	Keith Rothenberg/ Energy Metrics
Review Supervisor / Firm	JJ Hirsch & Associates
CPUC Staff Project Manager	[redacted] / California Public Utilities Commission, Energy Division
CPUC Staff Policy Authorization (as needed)	
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
CPUC Staff Recommendation	The ex ante savings estimates are not approved. The M&V plan is not approved. Commission staff will continue to review the project pending IOU submittal of additional requested information described below.

Measure Description

The project documentation describes an existing tomato processing facility that will increase its tomato paste production capacity by adding a mechanical vapor re-compressor (MVR) to recover waste heat. The recovered heat will be used to pre-concentrate raw product before it enters the existing three effect evaporator, increasing the system throughput.

Summary of Review

The Investor-Owned-Utility (IOU) submitted the following documents on.6/26/2014 for this Phase 1 review:

- 126591-[redacted] AESC Calcs.xlxs
- Apollo (MVR) Specs.pdf
- Engineer Design Schematics.pdf
- NRNC 126591 [Customer Name] MVR Pre-Install Final Report.docx
- Plant 2 production data xls.xlxs
- Usage History Gas.pdf
- Venus (3 Stage) Specs.pdf
- X436 - NC0127206 - [Customer Name] Plant 2 Expansion Check list.xlxs

The project was selected for review in October 2013. CPUC staff have reviewed the documents provided by the IOU on June 26, 2014. The documentation provides some detail for the project, however Commission staff are not able to fully comprehend certain aspects of the project. The IOU proposes that this is a new construction project. From the project description, it seems to be a retrofit add-on, capacity expansion project type.

The documentation refers to site level parameters and plant level parameters. A detailed description of the facility has not been provided describing how this plant is related to the site as a whole, how many other plants and other buildings are on site and what their functions are.

It is not clear if vapor entering the proposed re-compressor will come from both the existing 3 effect evaporator and/or other sources. Schematic system diagrams have been provided in the project documentation but there is no indication of the source of the vapor on the diagrams. Detailed drawings, P&ID's, SCADA screen captures, etc. have not been provided.

The ex ante calculation methodology seems to focus on estimating the ex ante impacts at the plant level using some site level parameters. The preliminary estimates of the project impacts appear to be reasonable, however the final ex ante impacts should be based on measured pre and post project parameters.

The calculation methodology and M&V plan provided in the documentation are of a general nature and lack specific details of what parameters will be measured, at what intervals the data will be collected, a specific duration required for the measurements. A calculation methodology demonstrating how the data collected will be used to verify the project impacts has not been provided. While the preliminary estimate of the project impacts have been prepared using some plant level and site level parameters, it may be advantageous to create a calculation methodology and associated M&V plan that assess the project impacts at the Plant 2 tomato paste production level.

It is important to quickly prepare a concise calculation methodology and M&V plan in case it becomes necessary to collect additional data during the customer's production season which is likely commencing now and usually runs through September.

The project documentation provides an incremental measure cost of $1,550,323 for the project. Review of information provided in Appendix B of the Final Pre install report indicates that this is an estimate of the total project cost, not the incremental project cost.

The current project status is unclear.

The IOU has not provided the EUL for the project.

A Savings by Design (SBD) Participation letter and/or signed application has not been provided.

Review Conclusion

The ex ante savings estimates are not approved. The M&V plan is not approved. Commission staff will continue to review the project pending IOU submittal of additional requested information described below.

Summary of CPUC Staff Requested Action by the IOU

CPUC Staff request that the IOU undertake the recommended steps and submit the following information due on 7/30/2014 (or 14 days from submittal date to IOU):

1. Provide a signed application and/or SBD Participation letter for the project
2. Provide an explanation of why the IOU considers this to be a new construction project, from the project description, it appears to be a retrofit add-on, capacity expansion project type.
3. Provide an update on the status of this project. Has the design been completed? Has equipment been ordered? Has construction commenced? What is the expected construction completion date?

4. Has the customer previously installed a mechanical vapor re-compressor at this site or another site? If so, provide a concise description of those projects.
5. Provide a detailed description of the facility describing how Plant 2 is related to the site as a whole, how many other plants and other buildings are on site and what their functions are. Describe important utilities such as steam which affect this project and may be generated centrally.
6. Describe if any electric pumps or other electric power source equipment is associated with this project.
7. Provide a description and/or diagrams showing the expected source of vapor entering the proposed MVR. Describe the pre-project and post project scenarios for this vapor including the mass flows, temperatures and pressures. Include the proposed post project MVR system. Describe if all vapor compressed in the MVR is expected to be used in the tomato paste pre-concentrating process, or if a portion of the recompressed vapor may be used for other processes, or possibly sent to condensers if there are reduced production demands.
8. The calculation methodology and M&V plan provided in the documentation are general and lack specific details of what parameters will be measured, at what intervals the data will be collected, a specific duration required for the measurements. The M&V plan simply states "a measurement and verification period for a minimum of one month at a minimum of daily resolution."

   Provide system diagrams or screen captures from SCADA graphics showing measurement points for the existing and proposed systems. Provide a calculation methodology demonstrating how the data collected will be used to verify the project impacts. Carefully consider and discuss the concept of creating a calculation methodology and associated M&V plan that assess the project impacts at the Plant 2 tomato paste production level. Consider a normalized analysis approach comparing the pre and post project (steam input)/(lb. of tomato paste product output). Describe how the plan addresses the possibility that a portion of the vapor compressed in the MVR cannot be used in the process, and must be sent to condensers. Consider a measurement period of an entire 110 day season, data collection in 15 minute or less intervals.

   The calculation methodology description should be comprehensive and complete leaving only the final verified variables and data to be determined after project completion. All that should be required after the project is completed is to input final project post verified data and assumptions into the proposed formulae to determine the ex ante impacts.

   Commission staff recommend that the IOU obtain P&IDs, screen captures from the

customer's SCADA system and proposed system design drawings so that existing and proposed measurement points can be assessed. The actual point names should appear in the calculation methodology and M&V plan. The calculation methodology and M&V plan should reference specific SCADA point names and describe data collected from temporary data loggers if they are required.

9. Provide an incremental measure cost for the project. Review of information provided in Appendix B of the Final Pre install report indicates that the estimated incremental cost of $1,550,323 shown in Table 1 of the Final Pre-Installation report is an estimate of the total project cost, not the incremental project cost.

10. Provide an EUL for the project.

CPUC staff are likely to ask for further clarifications and additional information as the details of this project become more clearly defined. CPUC staff requires that the PG&E:

1. Notify Commission staff within 10 days after either the implementer or the IOU become aware of any of the pre-installation information required to be submitted in items 1-7 above change during the project implementation phase.
2. Inform CPUC staff of the current project implementation status and the targeted implementation date.
3. Keep CPUC staff informed of the progress and next steps on this project.
4. Inform CPUC staff of future site visits, in case it chooses to send a representative on-site.
5. Provide sufficient opportunity for CPUC staff to review the requested data, analysis and calculations prior to the freezing of ex ante savings impacts for this project.

For all future projects (submitted after receipt of this review) Commission staff require that the IOU:

1. Provide precise step-by-step calculation methodology and equations proposed to be used to estimate the ex ante impacts for each custom project with detailed descriptions associating the proposed methodology with specific equipment and systems affected by the project. Provide system diagrams to facilitate the review of the project. The energy savings principle for each measure should be discussed. The calculation methodology description should be comprehensive and complete leaving only the final verified variables and data to be determined after project completion. All that should be required after the project is completed is to input final project post verified data and assumptions into the proposed formulae to determine the ex ante impacts. Generic methodology lacking such detailed specific associations is not acceptable.

   For example, for this project the calculation methodology and M&V plan provided in the documentation are general and lack specific details of what parameters will be measured, at what intervals the data will be collected, a specific duration required for the

measurements. The IOU has not described in detail how the pre and post project measurements will be used to estimate the ex ante impacts for this project.

2. Where M&V is proposed, the M&V plan should provide concise descriptions including measurement points, measurement period, measurement interval, measurement equipment, system diagrams, discussion of the accuracy measurement equipment and uncertainty associated with the results.

   For example, the M&V plan submitted with the IOU documentation of this project lack any specificity regarding point names, measurement intervals, system diagrams, etc. This level of documentation leaves the project vulnerable to having significant uncertainty in the savings analysis if all data required for the analysis have not been comprehensively conceived and clearly defined before the project is approved to proceed to implementation.

3. The IOU should ensure that the calculation methodology and M&V plan are detailed and complete before approving a project to proceed to implementation.

   For example, the file name of documentation provided for this project is "Pre Installation Final Report. The Calculation methodology and M&V plan are insufficient in that the final ex ante savings methodology and measurement requirements are incomplete. Final approval should not be granted until all of these details have been documented, reviewed and approved. If an M&V plan is not documented in sufficient detail, it is possible that some critical measurement point may not be installed. The customer must be aware of the measurement requirements and ensure that all required data points are installed as part of the project. The IOU should be certain that the customer is aware that they are required to provide this information as a condition of Program participation.

4. When deviations from proposed calculation methodology and/or M&V plans are necessary, the IOU should provide a well-documented explanation regarding the reasons for the variation from the original plan and a detailed description of the proposed changes to the previously approved (by Commission staff) approach to estimating savings impacts. Substantial changes to an approved project would normally invalidate any previously issued approval, so this information must be supplied to Commission staff as soon as possible (typically within 10 days if the implementer or IOU becoming aware) once the changes are identified and before the project proceeds.

5. Where important assumptions or project parameters which may affect the ex ante savings impacts have been verified, they should be clearly described in the documentation.

6. Commission staff have observed a wide variety of project documentation templates for custom projects. Many of the templates lack consideration for compliance with Commission ex ante policies which have been the subject of past ex ante reviews and

process discussions between Commission staff and the IOUs over the past two years. Commission staff recommend that the IOU require that all custom project documentation include a more standardized summary of important project parameters.

Table 1-2 Review Findings

Reviewed Parameter	Analysis
Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures, Major Renovation) Note: For early retirement projects only, include RUL through EUL baseline)	IOU Proposal: New Construction
	CPUC Staff Assessment: TBD
	CPUC Staff Recommendation: IOU to clarify if vapor entering the proposed MVR will be from both the existing 3 stage evaporator and/or other sources. IOU to explain why this project is not classified as a capacity expansion project type.
Project Baseline Technology (in situ equipment, Title 24 (specify year), other code or other efficiency level (specify), industry standard practice - ISP)	IOU Proposal: ISP
	CPUC Staff Assessment: TBD
	CPUC Staff Recommendation: Further investigation into ISP may be warranted depending upon determination of the project baseline type.
Project Cost Basis (Full Incremental, or Both. Note: For early retirement projects, include RUL through EUL cost basis treatment)	IOU Proposal: Incremental cost
	CPUC Staff Assessment: The incremental cost provided by the IOU appears to be the full project cost ($1,550,323) listed in Appendix B of the Final Pre-Install report. The IOU reviewer has determined that the two effect evaporator baseline described in Appendix B is regressive and invalid. The IOU should provide the incremental project cost based on the baseline and proposed systems described in the project documents.
	CPUC Staff Recommendation: IOU to revise the incremental cost estimate.
RUL (required for early retirement projects only, otherwise N/A)	IOU Proposal: NA
	CPUC Staff Assessment: NA
	CPUC Staff Recommendation: None
EUL (for each measure)	IOU Proposal: Not provided
	CPUC Staff Assessment: TBD
	CPUC Staff Recommendation: IOU to provide the EUL for the project.
Savings Assumptions	IOU Proposal: Complex spreadsheet analysis based on measured data,

Reviewed Parameter	Analysis
	assumptions and thermodynamic principals.
	CPUC Staff Assessment: Reasonable approach for providing a preliminary placeholder project impacts estimate.
	CPUC Staff Recommendation: None
Calculation Methods/Tool review	IOU Proposal:
	CPUC Staff Assessment:
	CPUC Staff Recommendation:
Pre- or Post-Installation M&V Plan	IOU Proposal: High level conceptual proposal to measure certain parameters, assume other parameters
	CPUC Staff Assessment: The M&V plan lacks detail.
	CPUC Staff Recommendation: M&V plan is not approved.
Net-to-Gross Review	IOU Proposal: .Not addressed
	CPUC Staff Assessment: TBD
	CPUC Staff Recommendation: TBD

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

Description	IOU Ex Ante Claim	CPUC Staff Recommendations
First Year kWh Savings	0	TBD
First Year Peak kW Savings	0	TBD
First Year Therms Savings	360,000	TBD
kWh Savings (RUL Period)	NA	TBD
Peak kW Savings (RUL Period)	NA	TBD
Therms Impact (RUL Period)	NA	TBD
kWh Savings (RUL thru EUL Period)	0	TBD
Peak kW Savings (RUL thru EUL Period)	0	TBD
Therms Savings (RUL thru EUL Period)	360,000	TBD
Annual Non-IOU Fuel Impact (RUL Period)	NA	TBD
Annual Non-IOU Fuel Impact (RUL thru EUL Period)	NA	TBD
Project Costs for Baseline #1 (RUL or EUL)	$1,550,323	TBD
Project Costs for Baseline #2 (EUL minus RUL period)	NA	TBD
Project Incentive Amount	$360,000	TBD