Phase 1 Ex Ante Review Findings

Table 1-1: Project Information

IOU	PG&E
Application ID	FPP 1261-12-678
Application Date	11/5/2012
Program ID	PGE2224
Program Name	Industrial Compressed Air
Program Year	2012
Itron Project ID	X239
IOU Ex Ante Savings Date	2/7/2013
ED Measure Name	Compressed Air System Modifications
Project Description	Install new compressor trim station (four 250 HP compressors), compressor controls, and no loss condensate drains.
Date of ED Review(s)	2/13/13
Primary Reviewer and Firm	Keith Rothenberg/Energy Metrics
Review Supervisor and Firm	Joseph Ball / Itron
Type of Review (Desk, On-site, Full M&V, Tool)	Desk
ED Recommendation	The project is conditionally approved. An interim analysis of the baseline air consumption is due in 90 days, prior to the installation of the new air compressors and controls. Ex ante savings estimates will be verified based on post installation M&V.

Measure Description

The application documents describe the proposed project as the installation of a new air compressor trim station, controls and no loss drains. The customer proposes to install four new 250 HP oil flooded rotary screw compressors. One of the proposed compressors will be VFD driven and act as the trim compressor. New controls will be installed to optimize the operation of the existing compressors and the new trim station.

The IOU has estimated net annual savings of 2,787,576 kWh and demand reduction of 314 kW associated with this project.

Summary of Review

ED reviewed the following documents as part its review of this project:

- [Customer Name] Project Description.doc
- [Customer Name] M&V Plan.doc
- [Customer Name] AIRMaster.mdb
- [Customer Name] Compressed Air Workbook.xls

The IOU requested an expedited review of the project at the end of 2012. ED representatives contacted the PG&E program manager and it was agreed that a phone call between ED representatives and PG&E's implementation team (PG&E) would be a good approach to clarify the project scope and answer ED's questions about the project. ED had numerous questions and it became evident that ED would not be able to complete the review for this project before the end of 2012. Additional phone conference calls have been conducted to further clarify the scope and answer details regarding the project M&V plan.

ED noted that the customer's compressed air system includes a 750 HP steam turbine driven compressor, which the IOU claims is the base load compressor. The IOU analysis did not include this compressor, as its operation is expected to be the same before and after the project is completed. ED requested that the M&V plan include pre and post installation measurement to verify that the operation of the steam compressor does not change after the project is implemented. Additionally, the customer operates a cogeneration system and receives steam from an adjacent power plant. These factors have the potential to complicate the analysis if the steam turbine driven compressor operation is not the same before and after the project is implemented.

The customer has agreed to install air flow monitoring for the compressed air system to verify the operation of the steam turbine compressor and other compressors in the system prior to other system modifications being implemented. ED requires that if the operation of the steam turbine driven compressor is not the same before and after the project is implemented, a fuel switching analysis (the three-prong test) will be performed as part of the ex-ante savings analysis. The 3P

Program implementer will provide an interim report of the analysis using 30 days of data of the baseline compressed air system airflow (and electric power usage if available) for ED review in approximately 90 days, and before any other system modifications are implemented. The new control system will include power monitoring for all electric compressors and several air flow and pressure measurement points. These data will be collected for a minimum of 30 days at one minute or less intervals after the installation is completed and will be used in the ex ante savings analysis.

Review Conclusion

The project is conditionally approved. An interim analysis of the baseline air consumption is due in 90 days, prior to the installation of the new air compressors and controls. Ex ante savings estimates will be verified based on post installation M&V.

Summary of ED Requested Action by the IOU

In order to complete an ex ante review the ED recommends that the IOU submit the following documentation, due as it becomes available:

1. Provide the interim pre installation air flow baseline data and analysis by May 12, 2013 for ED review.
2. Provide the proposed EUL for the project.
3. Provide the ex ante savings analysis and data following the completion of the project.
4. Provide the CAGI data sheets for the new compressors.
5. Provide project cost documentation.
6. Provide any IOU reviews for this project.
7. ED is likely to request additional information as the details of this project become more clearly defined.
8. ED requests that PG&E continue to keep ED informed of progress and next steps on this project.
9. ED requests to be informed of any future site visits including the post-installation inspection, in case it chooses to send a representative on-site.
10. ED requests the opportunity to review the requested data, analysis and calculations prior to the freezing of ex ante savings impacts for this project.

Table 1-1: 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)	Add-on Measures	Approved
Project Cost Basis (Full Cost, Incremental Cost)	Full cost estimated to be $750,000	TBD
RUL (Early retirement projects only, otherwise N/A (not applicable))	NA	TBD
EUL	TBD.	TBD
First Year kWh Savings	2,787,576	TBD
First Year Peak kW Savings	314	TBD
First Year Therms Savings	0	TBD
kWh Savings (RUL Period)	TBD	TBD
Peak kW Savings (RUL Period)	TBD	TBD
Therms Impact (RUL Period)	TBD	TBD
kWh Savings (EUL thru RUL Period)	2,787,576	TBD
Peak kW Savings (EUL thru RUL Period)	314	TBD
Therms Savings (EUL thru RUL Period)	0	0
Annual Non-IOU Fuel Impact (RUL Period)	NA	NA
Annual Non-IOU Fuel Impact (EUL thru RUL Period)	NA	NA
Net-to-Gross Ratio	Not provided	1.0

Table 1-2: Detailed Review Findings

Reviewed Parameter	Analysis
Project Gross Savings Baseline (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: Retrofit add-on
	ED Assessment: Correct
	ED Recommendation: Approved
Project Cost Basis (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: The total estimated cost has been provided
	ED Assessment: Full cost is appropriate.
	ED recommendation: None
RUL (required for early retirement projects only, otherwise n/a)	IOU Proposal: N/A
	ED Assessment: Correct
	ED recommendation: None
EUL	IOU Proposal: Not provided
	ED Assessment: TBD
	ED Recommendation: TBD
Savings Assumptions	IOU Proposal: 7 days of compressor amperage data and pressure data from portable loggers installed by the 3PP implementer were used to estimate the baseline compressed air system energy consumption and the savings potential with an AIR Master+ analysis.
	ED Assessment: The IOU analysis did not include the operation of the 750 HP steam turbine driven compressor.
	ED Recommendation: ED requires that the final analysis include the baseline and post installation operation of the 750 HP steam turbine driven compressor. The final impacts will be based on the pre and post installation M&V analysis.
Calculation Methods/Tool review	IOU Proposal: The project impacts are estimated using an AIR Master+ analysis.
	ED Assessment: ED has not reviewed this model in detail.
	ED Recommendation: The final analysis will be based on data collected from

Reviewed Parameter	Analysis
	the new control system and baseline data collected by the 3P program implementer.
Pre- or Post-Installation M&V Plan	IOU Proposal: Post installation data compressor kW and system pressure collected for 7 days. An interim air flow analysis will be provided before any modifications are performed to the compressed air system.
	ED Assessment: The M&V plan will be revisited after review of the interim air flow analysis and before the implementation of the project.
	ED Recommendation: IOU to provide the interim air flow analysis in approximately 90 days for ED review.
Net-to-Gross Review	IOU Proposal: Not addressed
	ED Assessment: This project received an extremely high NTG score of 1.0. The customer identified the compressor study performed by the 3P implementer (9/10) and the incentive offer (10/10) as the major drivers to this project. Non-program factors such as reduced maintenance, and standard practice did not have a significant impact on the decision. Without the program, the customer would have repaired the equipment for the next 20-25 years, with a trim compressor being added perhaps in 10 years.
	ED Recommendation: NTG Score 1.0