

## **Ex Ante Review Findings**

**Table 1-1: Project Information**

<b>IOU</b>	PGE
<b>Application ID</b>	1466-06
<b>Application Date</b>	11/14/2012
<b>Program ID</b>	
<b>Program Name</b>	Heavy Industry Energy Efficiency Program
<b>Program Year</b>	2013
<b>Itron Project ID</b>	X248
<b>IOU Ex Ante Savings Date</b>	Pending
<b>ED Measure Name</b>	Rapid Close Doors
<b>Project Description</b>	In this project, three manually operated freezer warehouse doors are to be retrofitted with automatic rapid close doors.
<b>Date of ED Review(s)</b>	Phase II: 01/31/2013
<b>Primary Reviewer and Firm</b>	Doug Maddox, James J. Hirsch & Associates
<b>Review Supervisor and Firm</b>	Nikhil Gandhi/ Strategic Energy Technologies, Inc.
<b>Type of Review (Desk, On-site, Full M&amp;V, Tool)</b>	Desk Review
<b>ED Recommendation</b>	Project approved; savings to be trued up after post-installation M&V.

## **Measure Description**

The measure involves the replacement of three manually operated exterior freezer doors with automatic rapid close doors. The freezers are operated at -10°F, and the doors range in size from 7 ft by 9 ft to 10 ft by 10 ft. The doorways have no secondary protective devices such as curtains to reduce infiltration when the doors are open.

## **Summary of Review**

The following documents submitted by the Investor Owned Utility (IOU) were used in this review:

- 1466-06 XXXX Arvin Speed Doors PCIP Rev1\_12.14.12.doc – Complete report describing measure, related building data, analysis and results.
- EnergyEfficiencyOIR-Post-2008\_DR\_ED\_317\_EEGA\_2566.doc – Response to Phase I EAR.

Energy savings were predicted using the Customized Calculation Tool 2011. Key inputs to this tool include door sizes, freezer temperature, type of secondary protective device, and operation scenarios for the existing and new doors. Outputs include annual kWh, peak kW and annual dollar savings. The tool appears to have been used correctly for the analysis.

Certain key issues regarding the use of the doors were not adequately described in the report. These are listed below, along with clarification provided by PG&E.

1. The report mentions that there are currently no secondary doorway protective devices (such as strip curtains) to reduce infiltration when the doors are open. Have these doorways ever had strip curtains? If so, why were they removed?

IOU Response:

The doorways do not currently and have never been equipped with strip curtains.

ED Assessment:

Accept.

2. No mention is made of the electrical consumption of the automatic doors. The Customized Calculation Tool does not appear to account for this additional energy usage.

IOU Response:

The existing doors are equipped with 0.5 HP motors while the proposed doors will be equipped with either a 3 HP or 1 HP motor. Based on the assumed openings per hour of 17, the baseline energy use is estimated to be 207 kWh/yr using a conservative assumed doorway travel time of 50 inches/second, while the proposed case is

estimated to be 355 kWh/yr based on a doorway travel time of 100 inches/second (rapid speed). The net difference of approximately -148 kWh/yr will be accounted for in the PIIP submittal as the CCT does not account for this additional energy usage and this is a very small percentage of the savings.

ED Assessment:

Accept.

3. Since this project appears to have been proposed as early replacement, the remaining useful life (RUL) of the existing doors must be considered. It must be determined whether a different baseline is needed for the period after the RUL, and whether early replacement is a valid claim.

IOU Response:

According to the site's Maintenance Manager, the existing doors were ordered as custom self supported insulated panels in 2005. Speed doors are not included in the DEER database. However, based on conversations with industry professionals from Rytec and Albany a typical EUL is 15 years with some doors built in the 1980's still in operation. Thus, the existing doors have > 1 year of useful life left and early retirement is the appropriate measure category. LM is in the process of obtaining pictures of the doors to provide additional confirmation that the existing doors have > 1 year of useful life left. These will be submitted as supporting documentation as an addendum to this response.

ED Assessment:

Accept.

4. The report indicates that the doors are all located at the loading dock. This implies that there are truck trailers backed up to the doorways at times, which would tend to reduce the infiltration compared with the assumption of a wide open doorway. If this is the case, some effort must be made to estimate the fraction of time trailers are docked, and the portion of the doorway that is blocked by a trailer.

IOU Response:

These doors do not open to docks, per se, but open to outside grade level driveways for forklift traffic to transfer product to other buildings. As such, truck trailers do not back up to the doorways at any time.

ED Assessment:

Accept.

5. The basis of the estimates of open/close times for the automatic doors is not explained. If there are periods where trucks are docked at the doors, then these likely need to be lengthened.

IOU Response:

The estimates of open/close times for the baseline were determined using hand logs gathered by site personnel. The existing doors are manual and opened with a pull string on each side of the door to open and close the door. Motion sensors are not used as the doors currently take too long to open/close for forklift traffic therefore they are left open for a majority of the time. One week of baseline operation will be monitored using a HOBO H06-001-02 logger that measures open/close state and will be used to verify/revise the submitted estimate of 15 min/hour open time.

The automatic doors (proposed) are Rytec Turbo-Seal, which open at a speed of 102 in/sec, and close at 51 in/sec. The open time was estimated based on the travel time of the proposed doors and an estimate of the time it would take a forklift to drive through the opening. The doors are opened and closed with a pull string. These values will be trued up during post installation monitoring using a HOBO HO6-001-02 that measures open/close state. As listed in the response for item 4, trucks do not park at these doorways.

ED Assessment:

Accept.

6. The report describes post-retrofit M&V activities, which include monitoring the number of passes per hour for each door and the average open time for each door. No explanation is given of how these measurements will be made, or over what time period.

IOU Response:

The number of passes per hour and the average open time for each door will be monitored with HOBO H06-001-02 loggers for a period of one week pre- and post-installation. These loggers use a magnet to determine whether a door is open or closed and records a time stamp for each instance. The results of this logging will be utilized to true up the post installation energy savings.

ED Assessment:

Accept.

## **Review Conclusion**

Project approved; savings to be trued up after post-installation M&V.

**Summary of ED Requested Action by the IOU**

Submittal of photos showing condition of existing doors.

Submittal of pre- and post-installation M&V results and updated energy savings.

**Table 1-2: Project Overview**

<b>Description</b>	<b>IOU Proposed Ex Ante Data</b>	<b>ED Recommendations</b>
<b>Project Baseline Type (Early Replacement, Normal Replacement, Capacity Expansion, New Construction, System Optimization, Add-on Measures)</b>	Early Replacement	Accept
<b>Project Cost Basis (Full Cost, Incremental Cost)</b>	\$64,220	Provide invoices upon completion.
<b>RUL (Early retirement projects only, otherwise N/A (not applicable))</b>	5 years	Accept
<b>EUL</b>	15 years	Accept
<b>First Year kWh Savings</b>	1,303,682	To be trued-up based on M&V results
<b>First Year Peak kW Savings</b>	180	To be trued-up based on M&V results
<b>First Year Therms Savings</b>	N/A	N/A
<b>kWh Savings (RUL Period)</b>	N/A	Calculate based on M&V results
<b>Peak kW Savings (RUL Period)</b>	N/A	Calculate based on M&V results
<b>Therms Impact (RUL Period)</b>	N/A	N/A
<b>kWh Savings (EUL thru RUL Period)</b>	N/A	To be evaluated in the PIIP.
<b>Peak kW Savings (EUL thru RUL Period)</b>	N/A	To be evaluated in the PIIP.
<b>Therms Savings (EUL thru RUL Period)</b>	N/A	N/A
<b>Annual Non-IOU Fuel Impact (RUL Period)</b>	N/A	N/A
<b>Annual Non-IOU Fuel Impact (EUL thru RUL Period)</b>	N/A	N/A
<b>Net-to-Gross Ratio</b>	Not provided	NTG interview may be conducted

**Table 1-3: Detailed Review Findings**

Reviewed Parameter	Analysis
<b>Project Gross Savings Baseline</b> (for early retirement projects only, include RUL through EUL baseline)	IOU Proposal: Baseline of 15 minutes per hour is proposed as a conservative assumption based on testimony of building manager and limited observation during energy audit. Expectation is that doors are open “most of the time”. With 17 door openings per hour, this corresponds to 25 seconds per opening.
	ED Assessment: Pre-retrofit data are needed to support baseline assumptions..
	ED Recommendation: True-up base line after collecting one week of pre-retrofit data of door operation.
<b>Project Cost Basis</b> (for early retirement projects only, include RUL through EUL cost basis treatment)	IOU Proposal: \$64,220
	ED Assessment: Appears reasonable as full cost estimate.
	ED recommendation: Provide invoices upon completion.
<b>RUL</b> (required for early retirement projects only, otherwise n/a)	IOU Proposal: With an EUL of 15 years and an early retirement measure category, the RUL is EUL/3 or 5 years.
	ED Assessment: Reasonable.
	ED recommendation: Accept.
<b>EUL</b>	IOU Proposal: Through conversations with industry personnel, 15 years is a typical EUL for industrial automatic doors.
	ED Assessment: Reasonable; subject to photos showing current state of existing doors.
	ED Recommendation: Accept.
<b>Savings Assumptions</b>	IOU Proposal: Measure assumes 6 seconds per opening for large door and 5.5 seconds per opening for smaller doors.
	ED Assessment: Needs to be verified
	ED Recommendation: Accept, with true-up after post-installation M&V.
<b>Calculation Methods/Tool review</b>	IOU Proposal: Input and output from Customized Calculation Tools were submitted
	ED Assessment: Values appear to be entered accurately into the tool.
	ED Recommendation: Accept pending tool review.
<b>Pre- or Post-Installation M&amp;V Plan</b>	IOU Proposal: Monitor door openings per hour and average open time for each door for one week pre-retrofit and one week post-retrofit. Measurements to be done using open/close state data loggers.
	ED Assessment: Reasonable.
	ED Recommendation: Accept.
<b>Net-to-Gross Review</b>	IOU Proposal: Note stated

*Ex Ante Review Findings*

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<b>Reviewed Parameter</b>	<b>Analysis</b>
	ED Assessment: None
	ED Recommendation: NTG interview may be conducted.