
ASW ENGINEERING MANAGEMENT CONSULTANTS

September 27, 2011

To: The SCE ISP evaluation team
SCE

From: Dennis Rowan, PE
ASW Engineering

Re: Investigations of Energy Efficiency Measures and Industry Standard Practice
[ISP-0002 Power Recovery Turbine Seal Replacement Project]

Dear ISP team,

ASW has conducted a review of the power recovery turbine seal replacement project and recommends that SCE consider that the project is not industry standard practice.

PROJECT BACKGROUND

This incentive would be based on a seal replacement project which allows the refinery in question to bring back into service power recovery turbines that were originally installed in the past. These were removed from service when their seals, using a single seal design, were introducing excessive seal lubricants into the product. The required pressure drop was then created by means of pressure reduction valves without use of the power recovery turbines.

The project includes the installation of dual seal design technology that minimizes lubricating fluid intrusion and allows these power recovery units to be brought back on-line without the introduction of excessive contaminants into the product. The dual seal design technology has been available for several years and has been published in several formats and publications.

By dropping the pressure from very high pressure to moderately low pressure, in the power recovery turbines, the site can save over 10,000 MWh of electricity annually. This equates to an annual cost savings of around one million dollars a year resulting from this project. The cost for the installation of the project is also around one million dollars indicating that the project would have paid back to the customer in about a year without any program incentives. With program incentives, the payback for this project reduces to around six months.

The reason for the delay in the implementation of this dual seal technology is given as a lack of funding priority and not a lack of financial viability for the project. This lack of funding priority is not defined and could be attributed to the customer not having the proper documentation of the financial analysis and/or not having a full accounting of the energy lost as a result of the turbine shut down.

There is no indication of maintenance issues or operational concerns with the valve pressure drop that was in operation prior to the project.

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ASW METHODOLOGY

ASW presents the following matrix of factors for your consideration regarding the seal replacement project:

Table 1: Factors indicating Industry Standard Practice

Factors Indicating Industry Standard Practice	Significance (1 – 3) 1=low, 3=high	Significance Explanation
Capturing large pressure drops with power recovery turbines has been conducted for many years.	2	Since this method of power recovery has been used for many years, standard practice is implied.
This site originally installed Power recovery turbines many years ago.	2	Since they already implemented this technology, they agree this should be done in production.
Their reasoning for not implementing this project sooner was given as a lack of funding priority.	1	Their reasoning does not state a lack of technology. What they state as their reason is a lack of priority indicating that they had more pressing issues, and they likely would have gotten around to this in due time.
The project payback was estimated at about one year without incentives, and six months with incentives, which makes it extremely viable financially.	1	Typically, these types of large projects with very good paybacks are the first to be implemented by large customers.
The incentive was available during previous program years and the customer did not participate.	1	This is further evidence that the customer interest in the incentives was minimal.

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Table 2: Factors indicating Non-Industry Standard Practice

Factors Indicating Non-Industry Standard Practice	Significance (1 – 3) 1=low, 3=high	Significance Explanation
A study in 2006 shows that a dual-seal configuration can minimize fluid infiltration. The customer declines to implement the technology and waits for the REEP study and program to implement the project.	3	Since the customer was likely aware of the upgrade in sealing technique for several years and did not implement it until the program developed the feasibility study and reserved the funding, this is strong evidence of program influence.
The original seals leaked excessive lubricant into the product stream causing too much contamination in the product requiring a new solution.	2	This indicates that the issue is not a simple maintenance issue. Complex issues require complex solutions handled by the customer outside their normal maintenance cycles.
The site lost one million dollars each year they did not implement this project.	2	If there were a standard solution out there, they would have implemented it during these years instead of losing all this money.
The customer did not participate in standard efficiency programs. Only the REEP was able to get the customer to move on the project.	2	Since the customer did not implement for up to 8 years under other programs which were offered each year, it is logical to conclude that the customer decision makers were not aware of the magnitude of the savings or the available funding. The REEP program demonstrated both and the customer signed up.
Company economic analysis placed the project below other projects in the funding priorities without the incentives.	1	The feasibility study is stated to have impacted the customer's decision to implement the project by detailing the incentives available through the program.

The factors in Table 1 indicating the project is industry standard practice are outweighed by the factors in Table 2 indicating the project is not industry standard practice. The primary consideration being that the customer was aware of the technology and did not choose to move forward with the project until the REEP study defined the cost benefit analysis for the customer along with the program incentives. REEP also provided the customer the turnkey participation that allowed them program access without the participation burden that typically accompanies these large projects with standard EE programs. REEP influence is apparent using these considerations.

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CONCLUSIONS

- ASW recommends that SCE consider this project is not industry standard practice since the factors for consideration are more weighted against industry standard practice. There appears to be a significant body of evidence to support the conclusion that this project installation was influenced by the REEP program and may not have been implemented during this program cycle without the REEP program influence.
- While power recovery turbines are industry standard practice, the question answered by this study is the influence of the program on the implementation of the project.

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