ASW ENGINEERING MANAGEMENT CONSULTANTS

September 28, 2011

To: The SCE ISP evaluation team
SCE

From: Dennis Rowan, PE
ASW Engineering

Re: Investigations of Energy Efficiency Measures and Industry Standard Practice
[Blue-Ray Disk Master Laser Retrofit Project]

Dear ISP team,

ASW has conducted a review of the Blue-Ray Disk Master Laser Retrofit Project and recommends that SCE consider that the project is not industry standard practice.

PROJECT BACKGROUND

Many Blue-Ray disk masters are made using gas lasers and that process can be upgraded to solid state lasers. This technology has been requested for consideration to receive an incentive through one of SCE's third party incentive programs.

The process uses a blue laser to cut pits while a red quality control laser provides real-time quality control to adjust and focus laser power. The process is said to provide a clean, smooth recording surface without molding problems like staining and provides a superior quality glass master.

The old gas laser operated in a high power state using about 10 kW of power with approximately 9.9 kW of that power going into heat that had to be removed with a cooling system with the remaining 100 watts going into the laser. This made the total system power near 20 kW to generate and maintain the laser.

The new solid state laser operates at 100 watts without the additional cooling load allowing for a reduction in system power of over 19 kW.

The new solid state laser does the same work as the old gas laser. The solid state laser did not alter the production throughput except to decrease down times associated with the gas laser. The solid state laser is not only operated at a far lower power level, but is capable of being shut down and turned back on readily where the gas laser required a 2 day sequence to get it operational and also included a lengthy calibration procedure. Since the restart procedure was so cumbersome, they only shut down the gas laser when necessary.

METHODOLOGY

ASW interviewed the site contact, and the project was confirmed installed and operational. The site contact indicated that the program influence was 4 out of 5 in making them decide to install the new laser at this time. When asked how long they would have waited to install the new laser without the program, the indication was that it would have been at least one year and likely 2 years out before they proceeded with the project. It was clear that they were going to proceed with the project but the program made them implement the project sooner rather than later.

Further investigation uncovered that the gas laser system was working properly and all indications were that the existing gas laser would have continued to operate for its expected useful life if not replaced. The expected life of the old gas laser is about six months. The expected life of the new solid state laser is about three years. The replacement costs for the two are similar in the $40,000 range.

ASW contacted a manufacturer of these solid state lasers. The manufacturer interviewed indicated that the payback on this technology is very short and it is noted that in this case it would have been less that one year. Typically any technologies that can payback in less than one year should be considered industry standard practice, but, as noted by the manufacturer interviewed, in this economy, the manufacturers of these disk masters are keeping their old equipment and not installing this new equipment even when the payback periods are demonstrated to be within six months.

ASW presents the following matrix of factors for your consideration regarding the Blue-Ray Disk Master Laser Retrofit Project:

Table 1: Factors indicating Industry Standard Practice

Factors Indicating Industry Standard Practice	Significance (1 – 3) 1=low, 3=high	Significance Explanation
This project has less than a one year payback.	2	Technologies that can payback in less than one year should be considered industry standard practice.
The expected life of the new solid state laser is about six times longer than the expected life of the old gas laser and their replacement cost is roughly equivalent.	1	Equal replacement cost and equivalent product for six times more life is a strong motivation.

Table 2: Factors indicating Non-Industry Standard Practice

Factors Indicating Non-Industry Standard Practice	Significance (1 – 3) 1=low, 3=high	Significance Explanation
The program incentives were the deciding factor for this project approval.	3	It has become apparent through our research that the measure would not have been implemented in this or likely not in the next program cycle without the influence of the program incentives.
These manufacturers are keeping their old equipment and not installing new technology even when the payback periods are demonstrated to be within six months.	2	These manufacturers are very difficult to move in the direction of energy efficiency. Any deviation from the norm is apparently program motivated.

The factors in Table 1 indicating the project is Industry Standard Practice (ISP) are outweighed by the factors in Table 2 indicating the project is Not Industry Standard Practice. The primary consideration being that the measure would not have been implemented in this or likely not in the next program cycle without the influence of the program incentives. Additionally, these manufacturers are very difficult to move in the direction of energy efficiency, and any deviation from the norm is apparently program motivated.

CONCLUSIONS

ASW recommends that SCE consider this project is not industry standard practice since the program is stated as a significant reason for the implementation. Further evidence of industry reluctance to adopt this technology was provided by the manufacturer of the solid state laser. While this resistance to technology improvement is contrary to typical behavior, it is what we have found during the course of this study.

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