

2013 Case Study

CST Storage

Intern: Josie Doefer
Major: Architectural Engineering
School: Kansas State University



Parsons, Kansas



Company background

CST Industries is a worldwide leader in the production of metal storage tanks, aluminum domes, and specialty covers. Currently there are more than 270,000 CST tanks and covers installed in 125 different countries. CST Storage is a branch of CST Industries that specializes in constructing the components of large bolt-together tanks. These tanks can be used to hold a large variety of items. CST Storage has several locations, but this study focused on the plant in Parsons, Kansas which is a 150,000-square-foot, ISO 9000-certified manufacturing facility.

Project background

CST Storage is a manufacturing plant that runs two shifts, five days a week. During the summer months, it even works extended shifts and some weekends. With increasing production, CST has focused on improving its process as much as possible. Part of this movement for improvement includes pollution prevention and waste reduction. For the third year in a row, CST Storage in Parsons, Kansas, has been involved in the Pollution Prevention Institute's intern program.

The intern this year looked into several projects including cardboard recycling, compressed air leaks, electricity conservation, waste heat recovery, and roof restoration.

Incentives to change

CST understands that implementing pollution prevention and waste-reduction projects can greatly improve the bottom line of the business, while also decreasing any damaging effects to the environment. By participating in the Pollution Prevention Institute's intern program three times CST is showing that these are areas of focus for the company. Having an intern from this program allows CST a three-party review of its pollution prevention efforts. Without this internship

program, it would be very difficult to find the time to concentrate on these problems and find potential solutions.

Projects reviewed for E2/P2 potential

1. Waste recycling

The intern last year had looked into the benefits of purchasing a cardboard baler. CST wanted the intern this year to look into some other options for recycling cardboard. The intern contacted Jason Thompson of Green Environmental Services in Erie, Kansas, and came up with a recycling bin option. For \$25 a month, CST could lease a 30-cubic-yard cardboard and office paper recycling bin from Green Environmental who would come empty the bin two to three times a month for a haul-away fee of \$125 per pull. A waste stream audit performed two years ago found that CST generated roughly 6.25 tons of cardboard waste each month. With the reduction in dumpster rental fees, the company would save approximately \$98 a month. The Total yearly savings comes to roughly \$1,176, and 75 tons of cardboard could be recycled instead of simply thrown away.

2. Distiller review

The intern was asked to review the solvent distiller performance of the recently purchased unit. The new 15-gallon distiller showed double the efficiency of the previous unit. This reduced the purchase of solvent from two orders a month to one order every other month. It also reduced the special waste produced by half.

3. Compressed-air leak audit

The company provided the intern with an ultrasonic leak detector and software from UE Systems to perform a compressed-air leak audit. The intern came in on a day when most of the plant was down and searched for air leaks. Thirty-eight air leaks, four welding gas leaks, and one natural gas leak were identified, and this information was entered into the spreadsheet provided by UE Systems. Total savings

from air leaks came to \$11,271 per year; savings from the welding gas leaks came to \$34,299 per year; and savings from the gas leaks came to \$1,695 per year.

4. Electricity conservation

The intern looked at the lighting in the manufacturing area and the office. This showed that lighting accounted for approximately 26% of the company's energy usage each year. By switching to more efficient systems, the company could reduce its energy consumption by nearly 400,000 kwh a year, which would save more than \$32,000 a year in energy costs.

The intern also looked at the powder coating room enclosure at the facility. There is an estimated 154,733 kwh per year wasted on conditioned air, which amounts to more than \$12,000 a year. By manufacturing covers for the opening during down time, the company could mitigate those losses.

The intern looked into two projects that could help CST conserve energy. One was fan usage on the plant floor. An inventory of the shop fans was performed and it was found there are 86 fans. The

intern created a spreadsheet to estimate the energy usage of the fans based on average temperatures that showed it takes approximately \$7,000 a year to operate the fans. Based on this, the intern recommended looking into more economical fan options, but more research is needed.

5. Roof restoration

The intern was asked to look at the possibility of applying a reflective roof coating. The coating would reduce indoor temperatures in the manufacturing area, which is not cooled during the summer, and extend the life of the roof almost indefinitely. This would divert 120 tons of roof waste by not reroofing.

6. Waste heat recovery

The intern looked at the possibility of recovering waste heat from the curing ovens on the paint line to heat the water in the parts washer at the plant. This would contribute to higher efficiency and lower gas usage. Initial investigations showed that it could be difficult to implement this since curing ovens are lower-temperature sources. Further research is needed for this application.

Summary of 2013 E2/P2 intern recommendations for CST Storage

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Cardboard baler	75 tons of cardboard	\$1,176	Recommended
Distiller review	8 tons of solvent	\$18,000	Implemented
Air leaks	54,988 kWh	\$4,399	In progress
Welding gas leaks	1,504,342 cubic feet	\$30,294	In progress
Gas leaks	578,160 cubic feet	\$1,799	In progress
Electricity conservation	522,652 kWh	\$51,182	Recommended
Roof waste	120 tons roof waste	\$852,000	Recommended
Total savings *	577,640 kWh, 195 tons solid waste	\$958,850	
GHG reductions *	1012.424 metric tons CO₂e		

* Does not include projects that are "not recommended" or where "further research is needed."