

2012 Case Study

CST Storage

Intern: Michael Claussen
Major: Industrial Engineering
School: Kansas State University

Parsons, Kansas



Company background

CST Industries is a worldwide leader in production of metal storage tanks, aluminum domes, and specialty covers. Currently more than 270,000 CST tanks and covers have been installed in 125 different countries. CST Storage is a branch of CST Industries that specializes in constructing 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.

Project background

CST Storage is a manufacturing plant that runs two shifts, five days a week. During the summer months, employees may work extended shifts and some weekends. With increasing production, CST has focused on improving its processes as much as possible. Part of this movement for improvement included pollution prevention and waste reduction. For the second 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, filter replacement schedules, compressed-air leaks, electricity conservation, washer chemical replacement, pump replacement in the powder coat booth, using a variable frequency drive in the paint booths, and painter training programs.

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 twice CST is showing these are areas of focus for its company. Having an intern from this program allows CST to have someone on staff who focuses solely on these types of projects. 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 Stark of Service Recycling and came up with a leasing agreement. For \$200 a month, CST could lease a baler from Service Recycling who would come pick up the bales once CST has acquired 10. Service Recycling currently pays \$40 per ton for the cardboard. A waste stream audit performed last year found that CST generates roughly 6.25 tons of cardboard waste each month. From that, it can be concluded that CST could earn \$250 each month from selling the bales. Also, CST could reduce trash payments by nearly \$500 a month. Total yearly savings comes to roughly \$6,500, and 75 tons of cardboard could be recycled instead of simply thrown away.

2. Filter replacement schedule

Filters in the primary paint booth are currently changed every shift. The intern looked into how often the filters actually need to be changed and performed a study of the potential savings. By studying the airflow in the booth after varying times of coatings application, the intern was able to conclude the filters can be used for two shifts. Also, at the end of two shifts, a group of six filters out of the total 15 had accumulated most of the overspray. It is believed that with further research CST can find a way to only change those six filters once a day and the other nine filters can last much longer. By doubling the life of the filters, CST can see savings in purchasing, disposing, and labor. The number of filters purchased could be cut essentially in half. This is a savings of roughly \$13,500 a year. Also disposal costs will decrease because fewer barrels filled with filters will be taken to the special waste dumpster. The intern calculated

savings from decreased disposals to be roughly \$4,000 each year. Finally, the labor required to change the filters will be reduced by half. This is an annual savings of roughly \$900. Adding all savings together, CST could see annual savings of \$18,500 from reducing the number of filter changes to once per day instead of every shift.

3. Compressed-air leak audit

The intern received 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. thirteen air leaks and one Argon leak were found, and this information was entered into the spreadsheet provided by UE Systems. Total savings from stopping air leaks came to \$4,399 per year, and savings from fixing the Argon leak came to \$30,294 per year.

4. Electricity conservation

The intern looked into two projects that could help CST conserve energy. One was fan usage on the plant floor. Upon observation, the intern found on average the plant floor had 15 fans running that were not necessary. After some calculations, it was found these fans were costing CST roughly \$600 per year. By simply informing employees of the need to turn fans off when they are not needed, CST could not only see monetary savings but also engrain an energy conservation mindset into its employees.

The intern also looked into vending usage. The vending machines are not utilized very often, yet they run all day every day. The intern looked into the benefits of implementing vending misers that use motion detectors to turn the machines on and off as

they are needed. Total estimated yearly savings from implementing the devices is \$930.

5. Washer chemical replacement

The intern looked into the possibility of replacing the chemical that is currently used in the wash cycle with a chemical that could run at a lower temperature. Benefits of a lower-temperature chemical are that CST would use less natural gas. Steve Lenger of DuBois Chemicals found a potential chemical that could run 20°F lower than the current chemical. The intern calculated the annual savings of this temperature drop to be roughly \$30,000.

6. Replacing pumps in the powder coat booth

The intern performed some cost analysis on the benefits of installing new pumps in the powder coat booth. New pumps would create a 176 cfm reduction. Using the cost of air calculated by the spread sheet used for the air leaks, the intern found this project would have annual savings of roughly \$13,700 on air costs alone.

7. Painter training.

The intern looked into the benefits of having painters and supervisors participate in a training program, thus giving CST the confidence that its painters would know all the most recent techniques. Also, there would be an increase in transfer efficiency which will reduce filter and paint usage. The intern researched a program with Perfect Finishes out of Wichita, Kansas. This group explained the training program could produce a 5-25% reduction in coatings and disposal costs. Even a 1% reduction in coatings costs would be an annual savings of \$32,000 for CST.

Summary of 2012 E2/P2 intern recommendations for CST Storage

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Cardboard baler	75 tons of cardboard	\$6,588	Recommended
Filter changing schedule	8 tons of special waste	\$18,552	Recommended
Vortex A/C and VFD	25,413 kWh	\$2,033	Recommended
Air leaks	54,988 kWh	\$4,399	In progress
Electricity conservation	19,138 kWh	\$1,531	Recommended
Argon leak	1,329,000 cubic feet	\$30,294	In progress
Washer chemical	6,000 MMBTU	\$30,168	More research required
Powder coat booth pumps	172,275 kWh	\$13,782	In progress
Painter training	3 tons less paint	\$32,000	Recommended
Total savings *	271,814 kWh, 86 tons solid waste	\$109,179	
GHG reductions *	482 metric tons CO2e		

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