2015 Case Study

CST Storage

Intern: Jade Edmonds
Major: Biological and Agricultural Engineering
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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.

Project background

CST Storage is very focused on improving their plant as much as possible, and one way they are addressing progress is by constantly improving their pollution prevention and waste reduction. They started using PPI intern program in 2011, and has implemented some of the projects suggested by the interns. These include building an enclosure around their powder coat room, re-routing water in their wash/rinse system, and updating the lighting in the plant and office areas.

The main areas of focus for this years intern were determining the efficiency of soft starts on air-compressors, conducting an air-leak audit, researching waste heat recovery from ovens, and replacing a burn-off oven with a fluidized sand scrubber.

Incentives to change

CST brought another intern in this year because they believe there are still ways to improve pollution prevention in their plant. Two important goals of the PPI program are to insure CST leaves less of an impact on the environment and that it is cost effective in the way they update their systems.

Projects reviewed for P2 potential

1. Re-routing heat from ovens: The intern was asked to determine if re-routing heat from the curing ovens to the off-set paint booth was a possible waste heat recovery project. To determine the feasibility of this undertaking, the intern brought in a group from the Industrial Assessment Center (IAC) to perform an energy audit. CST is expected to receive IAC's report by Oct. 1, 2015. Re-routing heat from the ovens is expected to reduce the amount of energy needed to heat another part of the plant, consequently reducing overall energy consumption. Pending the IAC report, more research may be required.
2. Installing soft starts on air compressors: CST has three air compressors, two of which have soft starts already installed. The intern looked into the effect of the first two soft starts on the plant's peak energy use by analyzing data from Westar's data-tracking website. The intern observed the first two soft starts dropped the average peak energy usage of the plant by 73.07 kW. The intern was then able to determine that installing a soft start on the last compressor would decrease CST's annual energy consumption by 189,415.33 kWh per year, saving $16,668.55 annually.
3. Heater vs heat exchanger: CST normally uses

a gas-fueled heater and an electric heater to heat water used in their washer. During May 2015, however, the electric heater broke and is being replaced. CST would like to determine if the current system would be more efficient if it were to be updated to a heat exchanger. Because the new electric heater has already been purchased and delivered to CST, the intern did not recommend updating the system at this time. This would potentially be a project for a future PPI intern.

4. Fluidized sand scrubber: CST uses a burn-off oven remove paint from conveyer hooks that was installed in 1990. The intern found the system used 300,000 BTU per hour and was operating six hours at a time, twice a day, with a two-hour cool down period, for 250 days per year. The 2011 PPI intern recommended replacing the burn-off oven with an infrared oven that would have an annual savings of $1,500. The 2015 intern recommended updating the burn-off oven with a fluidized sand scrubber. A fluidized sand scrubber would only have to be run for one hour to clean the parts, and would allow CST to scrub and rework parts that are now being scraped. For a six month period in 2015 CST has scraped $42,121.88 (including price of labor to make the defective part) worth of steel. The intern calculated CST would save $84,935.36 a year and use 226 MMBTU less natural gas per year by updating their burn-off oven. Updating the current system would reduce the amount of steel scraped by the plant as well as use less natural gas.
5. Air-leak audit: From plant drawings, the intern identified compressed-air lines and leaks in the plant. Upon performing the air-leak audit, the intern found 13 air leaks. These were tagged in the shop by the intern and recorded with the UE Systems software. The intern recommended CST begin fixing leaks, tackling those with the highest annual cost first. By fixing the air leaks found in the audit, CST will reduce energy consumption.

CST STORAGE

Summary of 2015 2 intern recommendations for CST Storage

Project description	Annual estimated environmental impact	Annual estimated cost savings	Status
Re-routing heat from ovens	-	-	More research needed
Installing a soft start	189,415.33 kWh	$16,668.55	Recommended
Heater vs heat exchanger	-	-	More research needed
Fluidized sand scrubber	266 MMBTU	$84,935.36	Recommended
Air-leak audit	90,884 kWh	$9,088.36	Recommended
Total savings *	**280,299.33 kWh, 266 MMBTU**	**$110,692.27**	
GHG reductions *	**288.32 metric tons CO_2e**		

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