Industrial Placement Intern: Eric Dreessen
Major: Chemical Engineering
School: University of Nebraska-Lincoln

Company Background

BD East in Columbus, NE is a part of Becton Dickinson Medical-Pharmaceutical Systems (BDM-PS). This facility manufactures prefillable glass syringes which are sold exclusively to pharmaceutical companies. The facility brings in glass tubing which are cut and formed into barrels, cleaned and sterilized, then sent to the pharmaceutical companies. The East Plant in Columbus is one of three worldwide that make glass syringes for BD and the only one that manufactures Accuspray flu mist syringes.

Project Description

The Environmental/Safety Engineer at BD East sought assistance from the P3 program to identify areas to reduce wastewater as part of a corporate wide effort to reduce water consumption by 15% by 2015. Assessing the flow of water throughout the facility was the first priority. From that water map, individual systems were analyzed and potential water savings opportunities were suggested for each.

Pollution Prevention Benefits

Several recommendations were offered to assist in minimizing the consumption of water at the facility. Benefits from the recommendations include lower operating cost and a smaller environmental footprint by the facility. The primary recommendation requires the purchasing of equipment and piping for in-process recycling and heat recovery and makes an impact on water consumption at the facility. The project's recommendations have the potential to meet BD's goals for both water and energy reductions.

Results

The pollution prevention opportunities identified for BD East are outlined below. An additional potential benefit of the Building Management System (BMS) Injection opportunity is a 5,290 pound reduction in chemical use per year.

Table 1: Overall Project Savings

Opportunity	Cost	Savings	Water Reduced (gal / year)	Electricity Reduced (kWh / year)	MT CO_2e Reduced per year	Payback Period (years)
SCF Recycle	$ 111,100	$ 281,300	18,880,000	3,536,000	3,430	0.39
Heat Exchanger	$ 20,000	$ 115,700	4,000,000 to 7,160,000*	1,840,000	1,770	0.17
Billing Change**	$ 0	$ 33,500	-	-	-	0.00
Check Valve**	$1,500	$51,500	-	-	-	0.03
BMS Injection	$900	$38,000	-	-	-	0.02
Total	$ 133,500	$ 486,500	22,880,000	5,376,000	5,200	0.27
			32.3% Reduction	**16.4% Reduction**		

*4,000,000 if implemented with SCF recycle and 7,160,000 if implemented alone
**Mutually exclusive recommendations (The Check Valve opportunity is most beneficial considering cost and annual savings.)