

Project Overview



Industrial Placement Intern: Jonathon Holmes

Major: Chemical Engineering

School: University of Kansas

Company Background

Nucor Steel – Nebraska is a bar mill located in Norfolk, NE that produces several different types of merchant or special quality steel bar including angles, channels, flats, and rounds. The steel has a variety of applications in fields such as automotive, construction, buildings, furniture, recreational and farming equipment. Much of the steel used in the manufacturing process has been recycled from other steel products.

Project Description

Nucor received technical assistance during the summer of 2008 from an on-site “Partners in Pollution Prevention (P3)” intern. Three main projects focusing on energy efficiency, water, solid waste reduction and oil use reduction were conducted. They included:

- An ‘Energy Dashboard’ was created to track the energy use in the Meltshop.
- A facility-wide water balance map was developed to show teammates how much water is entering, leaving, and evaporating at the facility.
- Bottle-less water dispensers were set up to reduce plastic bottle waste and suggestions were included to reduce Styrofoam plates and plastic silverware in the cafeteria.

Pollution Prevention Benefits

Due in part to the water balance map a \$65,000 heat exchanger will be replaced that will reduce evaporation rates by an estimated 30% saving 55,000 gallons of water per day. The Energy Dashboard project by providing immediate worker feedback can lead to better work practice when melting steel. If there is a minimal 1% decrease in energy usage, \$1,000,000 can be saved in a year, indirectly resulting in emission reduction of 10,000 metric tons of CO₂. Other suggestions with very short payback periods will lead to less solid waste generated.

Results

The pollution prevention benefits and results are summarized in Table 1 below:

Table 1: Pollution Prevention Benefits and Results

P2 Suggestion	Waste/Water Use Eliminated	Potential Cost Savings per year
Immediate monitoring through Energy Dashboard		\$1,000,000
Heat exchanger replacement identified by Water Balance Map	20,075,000 gallons water/yr	\$200,750
Bottle-less water dispensers and solid waste reduction	3,900 lbs solid waste/yr	\$9,200
TOTAL		\$1,209,950