American Ordnance

CASE SUMMARY 1

AMERICAN ORDNANCE

Middletown, Iowa
Des Moines County

Intern: Craig Cagney
Major: Mechanical Engineering
School: Iowa State University

The Company

American Ordnance, the operating contractor for the Iowa Army Ammunition Plant, operates on a 19,000-acre facility in Middletown, Iowa. American Ordnance has several processing operations for ammunition production, which include inspection, testing, cleaning, painting, heating, filling, curing and assembly.

Project Background

American Ordnance has a strong environmental program already in place, having achieved ISO 9001 certification and working toward ISO 14001 certification by the year 2005. Because American Ordnance is an operating contractor for the government, it must meet strict environmental standards.

Incentives to Change

American Ordnance's most expensive utility is compressed air. Due to the presence of explosives, electrical equipment is kept to a minimum and pneumatic equipment is used instead. Looking for ways to reduce compressed air waste is important because the price of energy is increasing. The intern worked to reduce wasted energy through the compressed air systems and develop a cost savings analysis.

Results

Compressed air system leaks

The majority of the wasted energy found on the production lines came from leaks in the compressed air system. The company purchased an ultrasonic leak detector and a leak detection program will be put in place. Five active production lines were checked for leaks throughout the entire system. A total of 454 leaks were found, totaling in a loss of 1,053 cfm, 1,721,000 kWh and a cost savings of $68,800. Each leak found was tagged and a list was given to the line pipe fitters for repair.

Installing a variable speed compressor on line 2

Two 250 HP oil-free compressors currently operate on line 2, with the capability of running 1,100 cfm of air. Once the air line leaks are repaired, the production lines only require 400 cfm of air flow. A 160 HP variable speed compressor is recommended to replace the two 250 HP oil-free compressors for an annual savings of $43,200 and 1,080,000 kWh. The air compressor will pay for itself in 1.13 years.

Installing a variable speed compressor on line 3A

The compressors on line 3A currently operate with a 125 HP or a 150 HP compressor. Data logging results indicate that once all leaks are repaired, the line will only require a 75 HP compressor to supply the demand. Installation of a 75 HP variable speed compressor would save $27,672 and 691,800 kWh annually. The payback for this compressor would be 1.33 years.

Training employees to use cost analysis spreadsheet

To ensure the leak repair program continues in the future, the intern trained mechanical and facilities engineering personnel about efficient use of the leak detector and associated use of the newly developed cost analysis spreadsheet to calculate costs and justify leak repairs.

Project Summary Table

Pollution Prevention Opportunity	Energy Reduction	Annual cost savings	Status
Repair of compressed air leaks	1,721,000 kWh/year	$68,800	Implementation in progress
Install variable speed compressor (line 2)	1,080,000 kWh/year	$43,200	Recommended
Install variable speed compressor (line 3A)	691,800 kWh/year	$27,672	Recommended
Totals	3,492,800 kWh/year	$139,672	