

General Electric

CASE
SUMMARY

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GE INDUSTRIAL SYSTEMS - SWITCHGEAR OPERATION

West Burlington, Iowa

Des Moines County

Intern: Sathish C. Sathyamurthy

Major: Master's in Industrial &
Manufacturing Systems Engineering

School: Iowa State University



The Company

The General Electric Company, or GE, is a multinational technology and services company and employs more than 300,000 people in 160 countries around the world. As of 2005, GE is the world's largest corporation in terms of market capital. The GE Burlington facility is a part of GE Industrial Systems, which specializes in products that are used to distribute and control electrical power. Since 1961, the Burlington operation has carried on GE's position as a worldwide leader in designing, engineering and manufacturing switchgear and related products. The 460,000 square foot plant has more than 500 employees.

Project Background

GE Burlington has committed to energy conservation and waste reduction through the implementation of continuous improvement projects. The facility has implemented and is in the process of implementing projects to reduce their energy consumption.

Incentives to Change

Several potential energy conservation and waste reduction projects were identified, such as reducing compressed air waste, electrical energy conservation, efficient lighting upgrades and exhaust waste heat recovery.

Results

Efficient Lighting Upgrade

The facility is lighted with high pressure sodium and fluorescent lamps. By retrofitting the plant with T8 lamp fixtures equipped with electronic ballasts, 2,092,010 kWh and \$126,666 is saved.

Eliminating the Evaporator/Condenser

A water recycler used in the tin/silver coating line utilizes electricity to recycle water. Instead of operating the recycler, freshwater can be supplied to the tanks. This would increase water usage and associated costs but will decrease electric consumption by 203,500 kWh, save \$14,500 and eliminate the problem of treating the concentrated sludge from the evaporator tank.





Compressed Air Update

Air leaks are the primary source of waste taking up 25 percent of the compressed air output (150 cfm). A quarterly leak-abatement/maintenance program will be highly effective in minimizing air loss in the system. Reducing supply pressure, utilizing cooler intake air for compression and running the more efficient compressor as the primary source are other suggestions that will conserve electricity. An estimated annual savings of \$15,314 can be obtained.

Cooling Fans

370 fans are used for comfort cooling on the manufacturing floor, some of which run unnecessarily. Installing switches on the fans and conducting training about the associated energy savings will reduce electrical waste and save \$1,110.

LCD Monitors

58 computers with CRT monitors can be replaced by energy and space saving LCD monitors that also last longer than CRT monitors. Replacing the shop floor computers will save \$1,180 in annual electricity cost, with a payback period of 6 years.

Exhaust Waste Heat Recovery

The facility has several exhaust stacks that emit hot air, two of which were identified as high potential heat recovery projects. Shell and tube heat exchangers could be used to extract hot water, which can then be used for space heating. However, the high capital cost of the heat exchangers makes the project not viable until a less expensive alternative is found.

Other projects

Designed employee training material on energy conservation; mapped lights/fans and computers used on the manufacturing floor and attempted to setup an automatic lighting schedule system; investigated the use of occupancy sensors for lighting.

Project Summary Table

Project Description	Environmental Savings	Economic Cost Savings	Status
Lighting Upgrade	2,092,010 kWh/year 433 kW peak demand	\$126,666	In Progress
Evaporator/Condenser	212,500 kWh/year 84 kW (peak demand)	\$14,500	Recommended
Compressed Air	279,574 kWh/year	\$15,314	Recommended
Cooling Fans	27,750 kWh/year	\$1,110	Recommended
LCD Monitors	16,100 kWh/year	\$1,180	Recommended
Heat Recovery	571 MMBtu/year	\$4,000	Not Viable
TOTAL	2,627,934 kWh/year	\$158,770	