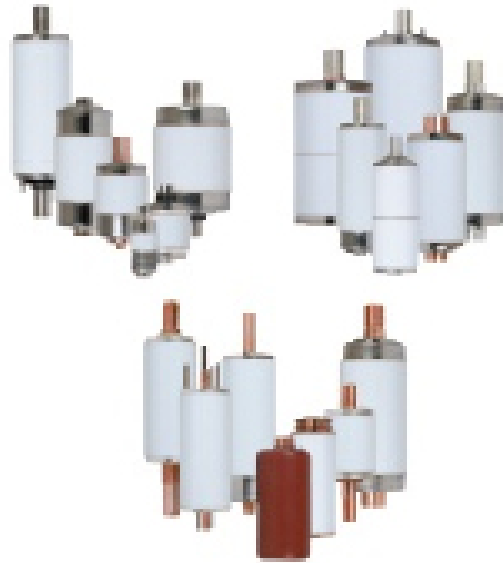


Assessment Overview

A team of students & faculty from the IAC at Syracuse University performed an industrial assessment for Eaton Corporation. The assessment was sponsored by the Department of Energy and was led by Center Director Frederick J. Carranti, P.E., a faculty member in the Department of Mechanical & Aerospace Engineering. In December 2010 the IAC team employed a comprehensive assessment methodology that considered energy, waste, & process-related improvements. The team examined all large energy-consuming equipment & systems for potential savings. They compiled a waste inventory & investigated the potential for waste reduction or improved disposal/recycling methods. The team also examined manufacturing processes for potential improvements, & emerging technologies were assessed for potential contributions to efficiency improvements.

Applications

The Syracuse University Industrial Assessment team identified opportunities to decrease energy usage, increase capacity, improve product quality, & enhance employee safety and comfort. The Industrial Assessment Center team accomplished this after conducting a comprehensive assessment of the company's systems and utility scheme. The team's goal was to identify significant opportunities for cost savings, quality improvements, & productivity enhancement.



Eaton's vacuum interrupters offer environmentally friendly products that are highly reliable, low maintenance and have a long lifetime. *Photo credit Eaton Corp.*

Summary

Through the Department of Energy's Industrial Assessment Center (IAC) located at Syracuse University, a vacuum interrupter manufacturer was able to realize significant savings from reductions in energy & productivity costs. Through recommended changes to the compressed air system, extending acid life and closing a heated water loop, the company is saving approximately \$105,291 annually.

Company Background

Eaton Corporation is headquartered in Cleveland, Ohio and was founded in 1911. Through its five sections including electrical, aerospace, hydraulics, filtration and vehicle, the company is the leader in end-to-end electrical components and systems for power quality, distribution and control, systems and services for industrial equipment, aerospace fuel, and hydraulics/pneumatics for commercial and military use. Eaton as a company believes that growth through acquisition is the quickest way to

grow their business whilst selling parts of the business that don't perform. Eaton's vacuum interrupters offer environmentally friendly products that are highly reliable, low maintenance and have a long lifetime.

Recommendations

The following table summarizes specific recommendations that were identified during the assessment and were implemented or will be implemented in the near future. These projections of savings & capital costs identified during the assessment have been

Assessment At A Glance

-Implemented over 85% of recommendations to save an estimated \$105,291

-Eaton successfully implemented five out of seven recommendations, all of which required less than 1 year of payback

established through engineering analyses and research. As a result, five recommendations were implemented by the company and are listed below.

Implementation

The company contacted the IAC team expressing concerns regarding both their energy and water usage. In total, 15 million gallons of water as well 47,760 kwh of electricity were saved annually. This effectively halved their

water usage per year.

Points of Interest

The company was able to realize significant savings by increasing the life of their electropolishing acid and decreasing their NaOH solution usage. Closing the water loop in the pilot line furnace achieved large savings through decreased water usage and sewer costs.

Implemented Recommendations

Assessment Recommendations	Annual Resource Savings	Total Annual Savings	Capital Costs	Other Costs	Simple Payback
Recover Sales Tax on Utilites	Avoided Cost: \$19,413	\$19,413	None	None	Immediate
Reduce Compressed Air System Line Pressure	Electricity: 10,260 kWh	\$2,375	None	None	Immediate
Install Acid Life Extender	Avoided Cost: \$50,189 Electricity: -11,280 kWh Demand: -23 kW	\$49,465	\$4,029	None	0.1 years
Duct Outside Air to Compressor	Electricity: 32,220 kWh	\$1,901	\$201	\$136	0.2 years
Close Pilot Line Furnace Water Loop	Avoided Cost: \$32,998 Water: 15,000,000 gallons Electricity: -13,440 kWh Demand: -27 kW	\$32,137	\$12,052	None	0.4 years
Totals	Avoided Cost: \$19,413 Water: 15,000,000 gallons Electricity: 47,760 kWh Demand: -50 kW	\$105,291	\$16,282	\$136	n/a

Other Recommendations

Assessment Recommendations	Total Annual Savings	Capital Costs	Other Costs	Simple Payback
Recover Sales Tax on Utilites	\$19,413	None	None	Immediate
Reduce Compressed Air System Line Pressure	\$2,375	None	None	Immediate