

Project Overview

Industrial Assessment Team
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Major: Chemical Engineering
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Summer Projects

The IA team spent the summer of 2005 providing technical assistance to five large industrial businesses in eastern and central Nebraska, including Vishay-Dale Electronics in Columbus, Nebraska. This assessment dealt with air compressor efficiency, equipment insulation, cooling water recycling, plastic recycling, finding alternative solvents, and electrical efficiency. The Industrial Assessment Team also reassessed four businesses that P3 interns served in the past.

Project Description

Several recommendations to assist Vishay-Dale were offered:

- Air compressor leaks were found, and the amount of lost energy due to the leaks was quantified.
- Insulation to reduce heat loss on ovens and ducting was suggested and savings quantified.
- The amount of water that could be saved by installing a closed-loop cooling water system was calculated.
- Since some of the plastic waste generated by Vishay is not handled by local recyclers, a recycler who would pick up the plastic at no charge was identified.
- Several alternative solvents were studied to replace the hazardous xylene/toluene mixture that is currently being used, and two were recommended as acceptable alternatives.
- Electrical efficiency throughout the plant was considered, and some suggestions were made to reduce peak demand and improve load factors.

Pollution Prevention Benefits

The pollution prevention benefits associated with the suggestions made to Vishay include reduced energy use, reduced water use, reduction in hazardous waste, and reduction in solid waste.

Results

The P2 suggestions offered to Vishay could save a total of \$134,900 each year, reduce water use by 8,572,000 gallons/year, reduce solid waste by 20%, reduce electricity use by 2,273,500 kilowatt hours, and reduce hazardous waste by 660 gallons/year. A summary of the projects and their potential results is provided in Table 1.

Table 1: Summary of Pollution Prevention Opportunities

P2 Opportunity	Annual Potential Savings	Quantification
Repair air compressor leaks	\$14,425	391,000 kWh
Replace oversized fixtures	\$1015	27,500 kWh
Install Hi-R roofing near air compressor inlet	\$1310	35,500 kWh
Insulate ducting and hoods	\$30,980	840,000 kWh
Insulate conveyor ovens	\$756	20,500 kWh
Switch to 6 day work week	\$15,717	
Change normal work hours	\$15,700	425,000 kWh
Increase load factor	\$19,700	534,000 kWh
Plastic recycling	\$1500	20% of solid waste
Switch to a less toxic solvent	\$960	660 gallons/year
Purchase safer immersion tanks	\$440	
Install closed-loop cooling water recycling system	\$32,400	8,572,000 gallons/year
Total Annual Potential Savings:	\$134,903	