



## **Water Flowmeter Manufacturer Plant: Manufacturer of Water Flowmeters Implements Big Energy Savings Recommendations**

**Assessment Date:** April 27, 2011

### **Summary:**

- Implemented six of the eight assessment recommendations and in the process of implementing two more
- Implemented recommendations will save approximately 9% of the total energy bill
- Recognized as a stand out Alabama IAC client

### **Applications:**

The Neptune Industries assessment team discovered opportunities to decrease energy usage thereby increasing capacity, improving product quality, and enhancing corporate competitiveness. In order to decrease energy usage, the assessment team identified potential energy savings on four different energy expending components of the facility.

In addition to the calculated energy savings the facility has sub-metered some of the systems in which recommendations were made and verified the savings.

### **Summary**

Through the Department of Energy's Industrial Assessment Center located at the University of Alabama at Tuscaloosa, Neptune Industries, a water flowmeter manufacturer, was able to realize significant monetary savings from reductions in energy consumption. Neptune Industries implemented six of the eight assessment recommendations and are in the progress of implementing another one of the remaining two recommendations. Savings resulted from reductions in electricity and natural gas usage. Through the implementation of these six recommendations, Neptune Industries was able to save approximately \$161,149. The overall average payback realized was 0.4 years. Savings realized from the implemented recommendations resulted in a 9% overall energy savings.

### **Plant Operation**

Neptune Industries manufactures a variety of water flowmeters and flow meter parts to customer specifications. Products are created first through by sand casting the brass housing for the meter. Once these castings have been retrieved from their sand molds they are then moved to the factory for assembly. The analog dials used in the flowmeters are created in the factory through an injection molding process. These dials analog with the magnetic metering mechanisms are installed into the water meter body on the factory floor. The facility consists of one 250,000 square foot building, and annual utility bills for the facility totaled approximately \$1,783,582.

### **Assessment Approach**

A team of faculty and students from the University of Alabama's Industrial Assessment Center performed an Industrial Assessment in the spring of 2011. The assessment was led by Center Director, Dr. Keith Woodbury, a Professor in the Department of Mechanical Engineering at the University of Alabama. A group of four students also participated in the assessment. The team spent one day on-site gathering information and making measurements regarding energy usage.

### **Energy Conservation Awareness**

Prior to the visit, Neptune Industries was employing several good energy conservation practices. The company was already making use of daylighting in some of their facility. Also, they are using a programmable thermostat that turns off the HVAC system on the weekends and unoccupied hours during the week.



## Energy Conservation Improvements

The University of Alabama Industrial Assessment team recommended the following measures, all of which were implemented by the company. These recommendations are designed to ensure reduced energy usage and more efficient operations:

- The facility was still using some metal halide lights and fixtures. Savings were realized by replacing the metal halide lights with fluorescent F54T5/HO fixtures. Additional savings on the lighting system was able to be achieved with the use of photosensors in areas that benefited from the natural daylight panels.
- The facility was maintaining their compressed air system at 100psi and was found that this could be reduced to 90psi. This would still provide the facility with the amount of pressure needed.
- The IAC identified several compressed air leaks caused by leaky valves and fittings in the distribution system. A program to repair the leaks and regularly check the air distribution components to detect leaks could be implemented to avoid the energy loss of compressed air leaks for \$3,900/yr.
- Optimization of the bag-house system resulted in fully loading two of the fan systems and turning off the third. This efficiency measure resulted in a savings of \$35,465/yr
- Lastly, the facility was able to install directional, automatic, lockable louvers on the make-up air system that avoided tampering by employees, as well as, directional control of the location the incoming air. This saved \$28,528/yr on natural gas by avoiding having to heat incoming cold air to a higher temperature.

## Results

Table 1 shows the annual cost savings that Neptune Industries obtained by implementing these energy conservation opportunities identified by the IAC team during the assessment. Based on these results, the facility can reduce energy consumption of electricity by 2,172,775 kWh/yr thereby saving the facility \$132,621 per year while also saving 3,734 MMBtu/yr of natural gas resulting in an additional \$28,528/yr saved. This results in a total cost savings of over \$160,000/yr. The total estimated implementation cost of these recommendations is \$59,982 yielding an overall simple payback of 0.4 years.

## Projects Identified

Opportunities for reducing energy consumption that were identified during the assessment are described in the following table:

<b>Table 1. Opportunities at Neptune</b>				
<b>Recommended Action</b>	<b>Annual Resource Savings</b>	<b>Annual Cost Savings (\$)</b>	<b>Implementation Costs (\$)</b>	<b>Payback (years)</b>
Replace Metal Halide Fixtures	170,057 kWh/yr	\$10,438	\$23,295	2.2
Utilize Photocell Sensors	47,869 kWh/yr	2,938	1,003	0.3
Reduce Compressed Air System Pressure	498,643 kWh/yr	30,417	1,000	0.0
Reduce Leaks in Compressed Air System	874,808 kWh/yr	53,363	3,900	0.1
Eliminate Bag-house fan	581,398 kWh	35,465	27,200	0.8
Install Automatic Louvers and Relocate Thermostats	3,734 MMBtu/yr	28,528	3,584	0.1
<b>Totals</b>	<b>1,543,508 kWh/yr</b>	<b>\$161,149</b>	<b>\$59,982</b>	<b>0.4</b>

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