ADVANCED MANUFACTURING OFFICE: INDUSTRIAL ASSESSMENT CENTERS

Efficient Lighting: Read all about it!

For many years, the installation of energy efficient lighting has been an easy way for facility managers to save energy. Now lighting choices have increased. Manufacturing facilities today are also integrating methods such as delamping and LEDs to reduce the electric load created by lighting. With their commitment to helping local industry realize cost and energy savings, the Industrial Assessment Center at the University of Alabama Tuscaloosa performed an energy efficiency analysis for Dow Jones - Wall Street Journal's manufacturing plant in the 2014. The assessment team, consisting of Center Director Dr. Keith Woodbury and a group of three students, identified eight key recommendations for cost savings.

Company Background

The Wall Street Journal , currently published by Dow Jones & Company, was established in 1889 by Charles Dow, Edward Jones, and Charles Bergstresser. The company was purchased by Clarence Barron in 1902. The Bancroft family, Barron's descendents, continued to control the company until 2007, when it was acquired by Newscorp. The LaGrange Georgia plant prints Wall Street Journal newspapers to service Georgia, Tennessee, Alabama, Mississippi, and the panhandle of Florida.

Newspapers flying off the production line. *Photo from internet source.*

Summary

Through the Department of Energy's Industrial Assessment Center located at the University of Alabama at Tuscaloosa, Dow Jones – Wall Street Journal, a newspaper manufacturer, was able to realize significant monetary savings from reductions in energy consumption. Dow Jones – Wall Street Journal implemented eight of the ten assessment recommendations which resulted in savings from reductions in both electricity and natural gas usage. Through the implementation of these eight recommendations, Dow Jones –Wall Street Journal was able to save approximately $41,407. The overall average payback realized was 0.8 years. Savings realized from the implemented recommendations resulted in approximately 17% overall energy savings.

Plant Operation

The facility is a 44,000 square foot, two-story building, and annual utility bills for the facility totaled approximately $239,724. Raw materials (i.e. rolls of newsprint and ink) are delivered via truck to the receiving area. The printing process begins with a pdf document of the paper to be printed, which is then laser-etched onto printing plates. These plates are loaded into the printing towers that contain the presses. The paper from the rolls is then fed up into the presses. After the paper is printed, it is folded and combined with the other sections. These folded papers are then sent to the mail room where they are bundled and shipped via conveyor to the loading dock.

Higher Efficiency Lighting

Lighting often accounts for a significant portion of most facilities' electricity bill, in energy demanded and subsequent dollars spent. However, lighting is becoming more and more energy efficient with the advent of newer technologies and materials. Many advances in efficiency for lighting fixtures are designed with respect to the industrial sector, which mandates the highest quality and quantity of light.

Energy Conservation Awareness

The Dow Jones – Wall Street Journal facility already employed several good energy conservation practices prior to the assessment. Motion sensors are used to turn off lights in the facility. Some daylighting panels are present in the news print storage area. The facility has a computer-based building energy management system which provides more efficient control of their heating and air conditioning system. Long-lasting, low-friction synthetic lubricants are used in the air compressors. The air compressors have variable frequency drives which reduce energy consumption. The facility has a program to recycle newsprint, cardboard, and other wastes.

Lighting Assessment

The team determined that the facility was over lit, and that energy can be saved by delamping. Removing half of the lamps in the facility will significantly reduce the amount of energy consumed while maintaining a sufficient lighting level. The exterior of the building has significant lighting. Replacing the metal halide security lighting and parking lot lights with LED fixtures will reduce the overall energy consumption due to the lower wattage of the LED fixtures. Inside the facility, replacing existing 400W metal halide fixtures with fluorescent T5 high-output fixtures will significantly reduce

Tabulated Savings Quantified

The following table shows the annual cost savings that Dow Jones – Wall Street Journal obtained by implementing these energy conservation opportunities. Based on these results, the facility can reduce energy consumption by 1,195 MMBtu/yr thereby saving the facility $41,407 per year. The total estimated implementation cost of these recommendations is $31,416 yielding an overall simple payback of approximately 0.9 years.

Implemented Recommendations

Assessment Recommendations	Annual Resource Savings	Total Annual Savings	Capital Costs	Simple Payback
Disconnect Unnecessary Lighting	359 MMBtu	$13,351	$1,728	0.2 years
Replace MH Lights with LED	186 MMBtu	$6,902	$13,479	0.6 years
Replace MH Fixtures with T5HO	33 MMBtu	$1,236	$783	7.7 years
Reduce Compressor Run Time	224 MMBtu	$8,308	$10,240	0.5 years
Reduce Air Leaks in Compressed Air System	139 MMBtu	$5,161	$2,500	1.8 years
Reduce Compressed Air Pressure	65 MMBtu	$2,421	$50	1.6 years
Adjust Set Points on Programmable Thermostats	59 MMBtu	$2,180	$0	0.5 years
Eliminate Air Infiltration through Shipping Door	130 MMBtu	$1,848	$2,636	1.8 years
Total	1,195 MMBtu	$41,407	$31,416	0.9 years