

Assessment Date: March 5, 2009

### BENEFITS

- The implemented recommendations resulted in annual savings of \$100,176.
- The implemented recommendations reduced total energy cost by 9%.
- Paybacks range from immediate to 30 months.
- Implemented recommendations reduced carbon dioxide emissions by 1,927,422 pounds.

### APPLICATION

The assessment team discovered opportunities to decrease energy usage and enhance corporate competitiveness. In order to decrease energy usage, the assessment team focused primarily on the lighting, boilers, heaters, and compressed air. The results at Miba Bearings will guide energy assessments at similar facilities, where the savings can be replicated.

## Miba Bearings US, LLC: Industrial Energy Assessment Yields Energy Savings of 9%

### Summary

The Industrial Assessment Center at West Virginia University was asked to perform an energy assessment at Miba Bearings. As a result of the assessment, recommendations were made for improvement in several areas. Opportunities for saving energy were identified as replacing existing metal halide and high pressure sodium bulbs with T5 bulbs, using blower air instead of compressed air in plant operations, adjusting the boiler air/fuel ratio, shifting operations to reduce demand costs, utilization of an existing capacitor bank, replacing 400W with 360W metal halide bulbs, recovering waste heat from the air compressor, replacing the existing T12 fluorescent bulbs and magnetic ballasts, using outside air for air compressor intake and repairing compressed air leaks. The assessment team also recommended the installation of a nitrogen generator which would allow the oxygen byproduct to enrich combustion air for the boiler as well as the installation of infrared space heaters and temperature setback controls. Nine of the 13 recommendations made by the team were implemented, resulting in the reduction of energy consumption by 5,516 MMBtu per year, and an annual saving of \$100,176 (9 percent of the energy consumption and cost). Three other recommendations are in the development stage under the TA protocol.

### Company Background

Miba Bearings specializes in the manufacture of locomotive and aerospace bearings. The facility is located in McConnelsville, OH. The plant and office cover an area of approximately 136,635 square feet. The office area is cooled with two 12-ton A/C units, six 2-ton A/C units and one 5-ton unit, and the plant area is cooled with sixteen 2-ton A/C units and one 5-ton A/C unit. The office area is heated with 38 radiant heaters of 2.2 kW capacity each, and the plant area is heated with three forced air heaters of 0.051 MMBtu/hr capacity each, one forced air heater of 0.076 MMBtu/hr capacity, eighteen air handling units of 0.32 MMBtu/hr capacity each and 2 boilers of 5.2 MMBtu/hr capacity each. The total energy consumption for the plant is approximately \$1,106,743 per year.

### Assessment Approach

An assessment team from the IAC spent one day at the facility, examining its operations and collecting data. The team was led by the IAC Assistant Director Dr. Wafik Iskander, Lead Student Ruben Avagyan and three graduate students.

### *Energy Conservation Awareness*

In general, the management and employees of Miba Bearings are “energy conservation” oriented, and follow many good practices to save energy. For example, the company uses outside air as well as recovers waste heat for one of their compressors, utilizes T8 florescent lighting with electronic ballasts in their offices and has some T5 gang florescent lighting in their plant. The assessment team applauded this awareness and worked on identifying other ways to save energy and discussing them in detail with all the parties involved in the assessment. All the recommendations identified by the team were also discussed at the end of the day, and the company’s personnel were encouraged to call the IAC Center at any time for further discussion and/or clarification.



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## Air Conditioning/Heating

As outlined in the company background, the company utilizes many air conditioning and heating units. By following the below recommendations, the facility can save a considerable amount on their cooling and heating energy cost.

- Install temperature setbacks controls on the heating and air conditioning units to allow for night and weekend temperature setback
- Replace existing heating system with infrared space heaters

## Compressed Air System

Compressed air is a significant energy consumer. The following measures can be taken to ensure reduce energy usage.

- Repair compressed air leaks
- Recover waste heat
- Use outside air for compressor intake

## Results

Table 1 presents the annual cost savings that would occur at the Miba Bearings facility due to implemented recommendations. Energy conservation opportunities identified in the assessment will reduce electrical and natural gas usage by over 9,114 MMBtu. This translates into an annual savings of \$142,502 and an annual reduction in CO2 emissions of 2,982,444 pounds.

## Projects Identified

List of implemented recommendations and recommendations that are in the implementation phase at this facility are described in the following table:

Table 1. Summary of Energy Conservation Measures at "MIBA" Facility McConnelsville, OH				
Recommended Action	Annual Resource Savings (MMBtu)	Annual Cost Savings (\$)	Implementation Cost (\$)	Payback (months)
<i>Process</i>				
Improve Power Factor	-	20,264	4,490	3
Eliminate Inappropriate Use of Compressed Air	1,064	16,484	11,250	9
Implement Demand Management Strategy	-	10,650	0	Immediate
<i>AC/Heaters</i>				
Install Programmable Thermostats	1,531	15,354	2,490	2
Install Infrared Space Heaters	1,972	20,144	22,048	14
<i>Boilers</i>				
Adjust Boiler Air-Fuel Ratio	1,487	15,020	2,500	2
<i>Lighting</i>				
Replace 400W Bulbs	347	5,395	-	Immediate
Replace Metal Halide/HPS Fixtures	1,913	29,790	72,987	30
Replace the Existing T12 Fluorescent Bulbs and Magnetic Ballasts	144	2,238	4,744	26
<i>Compressed Air System</i>				
Use Outside Air For Air Compressor Intake	78	1,219	582	6
Recover Waste Heat From Compressor	562	5,698	3,136	7
Repair Compressed Air Leaks	16	246	326	16
<b>Totals</b>	<b>9,114</b>	<b>142,502</b>	<b>124,553</b>	<b>10.5</b>

## PROJECT PARTNERS

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