

DIRECT ASSISTANCE PROGRAM



CASE STUDY

Acro Industries Partners with NYSP2I on Building Re-tuning Training (BRT)

Established in 1974 in Rochester, New York, Acro Industries, Inc. (Acro) is a privately owned sheet metal contract manufacturer. Acro provides laser, CNC punch, press brake, punch press, AWS certified welding, laminate and electro-mechanical assembly services. Acro has over 150 employees and serves a wide assortment of markets including: business equipment, aerospace, automotive, rail industry, transportation, health/medical, computer and electronic-based, and the alternative power industries.

CHALLENGE

While sophisticated energy management and control systems are used in large commercial buildings to manage heating, air conditioning, and ventilation systems, many buildings are not properly commissioned, operated, or maintained. This lack of proper operation and maintenance leads to inefficiencies, reduced equipment life, and—ultimately—higher energy costs.

The goal of this project, through a training program, was to increase the awareness of Acro's building managers and maintenance staff to 1) recognize energy efficiency opportunities within their facilities and 2) implement associated Energy Conservation Measures (ECMs), where possible.

SOLUTION

Prior to the training, the New York State Pollution Prevention Institute (NYSP2I) reviewed Acro's utility bills and performed various analyses of the energy consumption. NYSP2I also conducted a walkthrough of the facility that focused on the building exterior including the roof and a few sample rooftop HVAC units. The interior portion of the walkthrough included looking at insulation, HVAC ducting and balance, temperature controls, lighting controls, heat sources, boilers, and compressed air.

Acro worked with NYSP2I to conduct an on-site Building Re-tuning Training (BRT). The training program was held on April 14, 2015 and was intended to educate Acro's facility and maintenance staff how to perform periodic self-assessments of their facilities.

The training was based on curriculum developed by Pacific Northwest National Laboratories (PNNL) for small to medium sized commercial facilities. Under a grant from the National Institute for Standards and Technology's Building Construction Technology Extension Program (NIST-BCTEP), NYSP2I modified PNNL's curriculum to address the needs of small to medium industrial facilities, which included additional curriculum modules on compressed air, boilers and steam systems, and industrial refrigeration systems.

RESULTS

New York State Pollution Prevention Institute (NYSP2I) identified options for savings that involve implementation of Energy Conservation Measures (ECMs) which range from low to high cost with varying degrees of potential impacts. Opportunities identified as low or medium cost can be implemented more easily. The following opportunities were identified by NYSP2I during the training:

- For electrical power consumption, reducing demand charges could be accomplished if production could be spread out over 2nd and 3rd shifts, though higher wages could offset any savings realized. Based on company records, approximately \$6,000/month in demand charges are typical, constituting approximately 30% of the entire electric utility bill.

CHALLENGE

- Acro's building managers and maintenance staff needed assistance in recognizing energy efficiency opportunities within their facilities and implementing associated Energy Conservation Measures (ECMs), where possible

SOLUTION

- Acro worked with NYSP2I to conduct an on-site Building Re-tuning Training (BRT)

RESULTS

- Repair opportunities were identified on Roof Top Air Conditioning Units (RTUs) and further analysis, along with improved maintenance, could reduce overall energy use
- From NYSP2I's inspection of the roof, it was observed that white paint covered approximately 35% of the building (white paint helps to reduce radiant heat transfer and save energy). Acro should consider painting the rest of the 65% of the roof white
- A list of Energy ECMs were found, along with the potential savings of each, throughout the interior and exterior analysis of the facility.



- In regards to natural gas consumption, nominal savings are possible with an operational change from continuous hot water heating for a seldom used burnishing operation to heating only when needed.
- A volume-controlled shutoff switch set to 395 gallons would automatically shut the feed water off when volume for the copper coating process is reached; excessive water use can be avoided.
- Further analysis and improved maintenance on Roof Top Air Conditioning Units (RTUs) could reduce overall energy use as issues and repair opportunities were identified on some RTUs.
- As part of the building's exterior inspection, several improvement opportunities were identified and summarized in Table 1 below. NYSP2I also inspected the roof and observed that white paint covered approximately 35% of the building, which helps to reduce radiant heat transfer and save energy. Acro should consider upgrading the remaining roof areas by painting them white.

Table 1 - Exterior Walkdown Observations and ECMs.

Item	Energy Conservation Measure (ECM)	Effort	Potential Savings
Front Door Seal	Leaking all around. Needs caulking and new seals	Low	Medium
Office Windows	Remove and replace cracked or missing glazing	Low	Medium
Shipping door weather-strip	Replace weather stripping and align door	Low	Medium
Man door next to shipping door	Door frame separated from wall. Repair	Low	Medium
Old office window above shed	Needs to be sealed, replaced or blocked off	Low	Low
East side exterior wall	Holes in block, birds living inside wall. Repair holes after birds have left.	Medium	Low
East side man door	Propped open on cold day, no weather stripping. Investigate heat controls and seal door.	Low	High
South side man door	Hole in cinder block next to door. Repair hole	Medium	Medium
South side holes in wall	Bird nests in holes in wall. Repair holes after birds have moved out.	Medium	Low
Gas lines not sealed	Gas line entrances in south wall not sealed. Seal.	Low	Low

- The interior walkdown portion of the BRT training at Acro a produced a list of ECMs, many of which are low cost that Acro can readily implement to reduce the energy consumption at their facility (Table 2). More importantly however, Acro's staff were instructed in re-tuning for energy efficiency.

Table 2 - Interior Walkdown Observations and ECMs

Item	Energy Conservation Measure (ECM)	Effort	Potential Savings
Ceiling Ductwork condition	Per Acro staff, the ductwork is uninsulated and leaky. Insulate and repair to reduce heat loss.	Med	Med
Roof Insulation	Add insulation to ceilings of high bays and office areas.	High	High
Office Thermostats	Program office thermostats to take advantage of office hours.	Low	Med
Wall Insulation	Similar to ceiling insulation, adding wall insulation will reduce heating and cooling energy load	High	Medium
Plant Thermostat	In heating mode with adjacent exterior door open – turn off when door is open	Low	High
Process Hot Water always on	Turn off the process hot water when not needed.	Low	Low
RTU air leaks allows cold air ingress	One of the new RTUs needed to be wrapped in plastic to prevent cold air ingress during winter. This could be symptomatic of broken or stuck dampers.	Med	High
Compressed Air Usage	In general, compressed air efficiency is approximately 7%. During the walkdown, several instances of unnecessary compressed air use were noticed. Where possible, part and fixture cleaning should be performed by alternate means. Consider coolant flush, brushes or wiping operations instead.	Low	High

As a result of NYSP2I's Building Re-tuning Training, Acro has already taken some steps towards energy use reduction. Lighting retrofits have been implemented throughout the building and the building appears to be maintained at high level. Many of the ECMs listed in this report are commonly overlooked items and considered minor when viewed alone. Collectively, however, they can have a significant impact on building energy use. Some of the more costly items like wall and roof insulation should be evaluated using return on investment analysis.

NYSP2I PARTNERS



New York Manufacturing Extension Partnership

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