Zach Zurbey

Consolidated Precision Products

Electrical and Thermal Efficiency

CPP

Zach Zurbey

Mick Jost

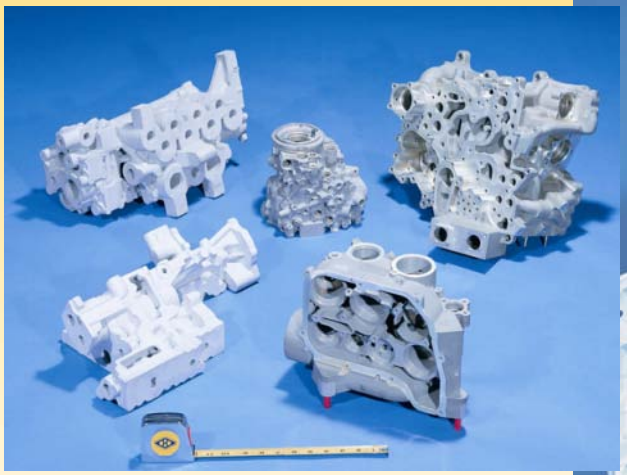
Minnesota Technical Assistance Program

UNIVERSITY OF MINNESOTA

Driven to Discover℠

Company Overview

- Specialize in premium quality magnesium and aluminum castings
  - Boeing
  - GE
  - Honeywell
  - Airbus
  - Military



Motivations for Change

- Implement Energy Management Plan
  - Reduce Energy and Costs
  - Monitor Uses / Equipment
  - Increase Reliability and Capacity
  - Building Automation

Reasons for MnTAP Assistance

- Provide a new perspective
- Allow for position not influenced by production needs

Approach

- Examined production flow
- Gathered baseline measurements / info
  - Air flow
  - Equipment run time
  - Identified high HP motors
  - Power consumption
  - Heat loss and temperatures
  - Natural gas consumption

Determining Inefficient Processes

- Determined what equipment uses significant energy
- Examined operational needs

Facility Pressure/Exhaust

- Significant exhaust flow
- Costs to operate are high
  - 590 HP through exhaust stack
- Issues with comfort during winter
  - Heat loss

Facility Pressure/Exhaust

- Solution
  - Reduction of static pressure
    - Reduced flow through stack by near 50%
  - Flow reductions
    - VFDs
    - Point of use
    - Duct changes
  - Isolate areas
    - Logic/Sensors
    - Timing/Control

Facility Pressure/Exhaust

- Reduction Results

Reduction	kWh	Therms	Savings	Investment
Alum Pour	200,200	11,000	$21,300	$13,500
Sandblast	54,000	3,100	$5,700	$5,700

- Recommendations

Reduction	kWh	Therms	Savings	Investment
Mag Pour	415,000	20,000	$41,600	$47,500
Shake Out	509,100	3,300	$36,800	$20,600

Process Oven Efficiency

- Ovens used for aging, heat treating, and baking off sand
- Low Efficiency
  - Run Times 6570 Hr.
- Solutions
  - Preheat Combustion Air
  - Replacement/Re-insulate

HVAC Improvement Opportunities

- MAU used to heat majority of production area
- Outdated technology / Short Circuit
- Solutions
  - Add ductwork
  - Replace controls
    - VFD
  - Recover Heat

Other Opportunities

- Compressor air reduction
  - Condensate Drain
  - Dust Collectors
  - Leaks
- Ladle insulation
- Lighting controls

Successful Process Changes

- Successful Changes
  - 254,000 kWh
  - 20,400 therms
  - $31,000, cost $26,200
- Recommended
  - 1,000,000 kWh
  - 53,000 therms
  - $100,000, cost $85,000

Personal Benefits

- Gained hands on industry experience
  - Work with contractors
- PLC ladder logic and sensor integration
  - Automation
- Exercise the application of math and design