Company Overview

• Concrete pumps
• Concrete mixer trucks
• 202 Full time employee
Company Overview

SP 500

S 39 SX

Minnesota Technical Assistance Program

University of Minnesota
Motivations for Change

- Increased production with construction market comeback
- Opportunity to reduce waste in production process
- Decrease cycle time per unit
- Decrease energy use
MnTAP Assistance

• Facilitate lean manufacturing changes on the production floor
• Use their energy saving expertise
• Have the process examined from outside the company
What is Lean Manufacturing?

• A production practice that reduces the expenditure of resources for any goal than creation of value for the customer.
Seven Wastes of Lean

- Overproduction
- Inventory
- Defects
- Non-value added processing
- Waiting
- Motion
- Transportation
5S Summary

- Sort
- Set in order
- Shine
- Standardize
- Sustain

Before and After images of an Office Supply Cabinet.
Kaizen Definition

- Brings a team together
- Makes a process leaner
- Short period of time
- Quick results
Kaizen Event Process

- Form group of people from different viewpoints
- Define current process
- Identify areas to improve
- Implement changes for improvement
Kaizen Event Goals

Enterprise Minnesota provided training for the first event

• Equal space in stalls
• Limited time out of stall
• 30 second rule
• Organized workspace (5S method)
• Reduced defects
Space in Stalls
Kaizen Event Results

• Paint floor with labels
• Utilize cleaning audits
• Initiate hardware tray
• Utilize cart with tools and supplies
• Facilitate corrective and preventative action (CAPA) program
CAPA Program

- Tracking errors made
- Investigating root cause
- Implementing solution
### CAPA Program

<table>
<thead>
<tr>
<th>Failure Mode</th>
<th>Corrective Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaking oil cooler</td>
<td>Introduce Torque Wrench</td>
</tr>
<tr>
<td>Steps are not level</td>
<td>Added note to drawing on correct process</td>
</tr>
<tr>
<td>Gauge facing wrong direction</td>
<td>Corrected book</td>
</tr>
<tr>
<td>Valve spins freely</td>
<td>Engineering redesign</td>
</tr>
<tr>
<td>Brackets interfere with door</td>
<td>Engineering redesign</td>
</tr>
<tr>
<td>Loctite not on chain link</td>
<td>Vendor informed of change</td>
</tr>
<tr>
<td>E-stop switch set too high</td>
<td>Set standard range, added to book</td>
</tr>
<tr>
<td>Grease line routed wrong</td>
<td>Corrected book</td>
</tr>
<tr>
<td>Water leak</td>
<td>Use Teflon tape not pipe sealant</td>
</tr>
<tr>
<td>Remove springs</td>
<td>Engineering removing from drawing</td>
</tr>
<tr>
<td>Fill taped holes with silicone</td>
<td>Added note to drawing to silicone</td>
</tr>
<tr>
<td>Outrigger makes noise</td>
<td>Added note to use anti seize on bearing</td>
</tr>
</tbody>
</table>
Paint Booth Energy

- Analyzed 5 paint booths
- Estimated energy use
- Recommended combination that uses least energy
Forklifts

- Observed forklift travel
- Diagramed travel in a spaghetti diagram
- Looked for areas to improve travel
- Created staging areas for pallets
Compressed Air

- Introduce a 6 month or yearly audit
- Estimate leaks in system
- Tag leaks and repair on priority system
- Paint building; 3.8% decrease in electricity use per year
## Summary

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Environmental Savings</th>
<th>Implementation Cost</th>
<th>Annual Savings</th>
<th>Payback Period</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paint Booth</td>
<td>24,150 kWh</td>
<td>$0</td>
<td>$2,600</td>
<td>Immediate</td>
<td>Recommended</td>
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<tr>
<td>Configuration</td>
<td></td>
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<td></td>
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<tr>
<td>Paint Booth</td>
<td>2,530 Therms</td>
<td>$0</td>
<td>$2,040</td>
<td>Immediate</td>
<td>Recommended</td>
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<tr>
<td>Configuration</td>
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<td></td>
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<tr>
<td>Compressed Air</td>
<td>21,000 kWh</td>
<td>$0</td>
<td>$2,125</td>
<td>Immediate</td>
<td>In Progress</td>
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<td>Leaks</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Forklift</td>
<td>390 gallons</td>
<td>$0</td>
<td>$975</td>
<td>Immediate</td>
<td>In Progress</td>
</tr>
</tbody>
</table>

*Minnesota Technical Assistance Program*
Personal Benefits

- Experience in a manufacturing facility
- Experience in a real world lean manufacturing project
- Energy conservation methods
Questions?