

Lean Manufacturing and Energy Savings Schwing America

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Company Overview

- Concrete pumps
- Concrete mixer trucks
- 202 Full time employee



Company Overview



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



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

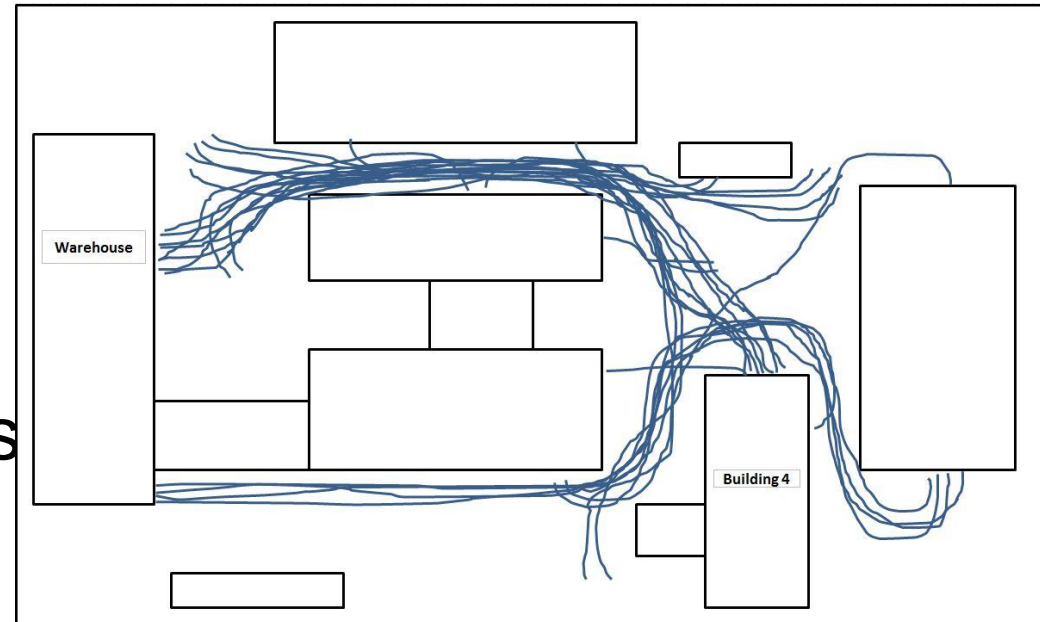
| Failure Mode | Corrective Action |
|--------------------------------|--|
| Leaking oil cooler | Introduce Torque Wrench |
| Steps are not level | Added note to drawing on correct process |
| Gauge facing wrong direction | Corrected book |
| Valve spins freely | Engineering redesign |
| Brackets interfere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

Paint Booth Energy

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

Forklifts

- Observed forklift travel
- Diagrammed 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

| Recommendation | Environmental Savings | Implementation Cost | Annual Savings | Payback Period | Status |
|---------------------------|-----------------------|---------------------|----------------|----------------|-------------|
| Paint Booth Configuration | 24,150 kWh | \$0 | \$2,600 | Immediate | Recommended |
| Paint Booth Configuration | 2,530 Therms | \$0 | \$2,040 | Immediate | Recommended |
| Compressed Air Leaks | 21,000 kWh | \$0 | \$2,125 | Immediate | In Progress |
| Forklift | 390 gallons | \$0 | \$975 | Immediate | In Progress |

Personal Benefits

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

Questions?