Improving Process Efficiency
Lou-Rich, Inc.
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Company Overview

• Contract engineering and manufacturing
• Based in Albert Lea, MN
• Provides services to original equipment manufacturers (OEMs) in ag., medical device, food service, and many more
• Services include: engineering design for manufacturing services, material sourcing, welding, assembling, testing, CNC machining, fabrication, powder/liquid coatings, assembly, aluminum extrusions
Process Description

• 5 different freezers made – all follow similar processes
• Components (coils, flanges, and tubes) made
Process Continued

• Washed

• Welding tube and flange
Process Continued

- Soldering coil to tube

- *Base and inlet welding
Process Continued

• Machining Processes

• Foaming
Incentives to Change

• Commitment to process improvement
• Investigate process efficiency opportunities
• Source reduction opportunities in washing system
Reasons for MnTAP Assistance

• Investigate/implement lean opportunities
• Look for opportunities to improve operator processes
• Determine opportunities for chemical and water savings
• Reduction of inventory in work cells
Approach

• Monitored and gained understanding of processes
• Documented own ideas for improvement
• Held brainstorming sessions and documented ideas for improvement
  • Identified the types of waste and where it was occurring
Determining Solutions

• Timed processes
• Value-stream maps
• Spaghetti diagrams
• Consulting with companies
• Reviewed observations and notes
• Meetings with staff and operators
Current Layout and Part Movement

• Opportunities
  • Excess movement taking parts to and from work cells
  • Loading time onto carts and machines

• Solutions
  • Implement conveyor system between work cells
  • Change equipment orientation and locations

• Savings
  • ~260 hrs/year → $7,100/year
Washer Location
Proposed Layout
Spaghetti Diagrams

Current Movement

Proposed Movement
Coiling and Foaming Processes

- **Opportunities**
  - Inventory build up between process steps (non value adding time)
    - Excess inventory
    - Waiting
  - Order of operations efficiency

- **Solutions**
  - Creation of standard work documents
  - Training and explanation to operators

- **Savings**
  - ~420 hrs/year → $11,500/year
Current State Part Washing Process

- **Coil Washer**
  - Not performing up to washing standards
  - Chemical and water go straight to drain after one cycle

- **Hallway Washer**
  - Wash, Rinse, Blow off
  - Operators paid to load and unload parts
  - Parts from different areas washed in same washer
Proposed Improvements

• **Remove coil washer**
  • Power, water, and chemical savings
  • No chemical and water being wasted

• **Purchase New Washer and Place in Freezer Area**
  • Dual-rinse and overflow system to conserve water and reduce operator attention
  • U-shaped design
  • Current operators will be reassigned
  • No waiting for non-freezer parts
  • Elimination of forklifts and operator time transporting parts
Improvement Savings

• Savings

Coil Washer
• ~1,270 kWh/year → $100/year
• ~19,200 gal/year → $120/year
• Chemicals - 866 gal/year → $13,000/year

New Washer
• ~280 hrs/year → $7,700/year
• ~29,300 gal/year → $180/year
• Not using forklifts → $1,750/year
• Not paying operators → $2,550/year
Part and Finished Product Storage

• Opportunity
  • Large amount of inventory between work cells (space, $)
  • Trouble adjusting to order fluctuations (change-overs, shipping dates, part moving and storage)
  • Distance and time to bring components needed to assembly areas

• Solution
  • Install finished goods supermarket (buffer for changes)
  • Part supermarket (ordered and proximity to cells)
    • Pull system based on demand rather than push based on predictions

• Savings
  • ~50 hrs/year → $1,400/year
## Recommended Changes

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Water (gpy)</th>
<th>Operators (hrs/year)</th>
<th>Net savings ($/year)</th>
<th>Implementation cost</th>
<th>Payback period</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>Layout and Conveyor System</td>
<td>0</td>
<td>260</td>
<td>$7,100</td>
<td>$5,000</td>
<td>8.5 months</td>
<td>Proposed</td>
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<tr>
<td>Implement Standard Work</td>
<td>0</td>
<td>420</td>
<td>$11,500</td>
<td>0</td>
<td>Immediate</td>
<td>Implemented</td>
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<tr>
<td>Implement New Washer</td>
<td>29,300</td>
<td>280</td>
<td>$12,180</td>
<td>$130,000</td>
<td>10.8 years</td>
<td>Proposed</td>
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<tr>
<td>Remove Coil Washer</td>
<td>19,200</td>
<td>0</td>
<td>$13,220</td>
<td>$500</td>
<td>13 days</td>
<td>Proposed</td>
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<tr>
<td>Implement Supermarkets</td>
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<td>50</td>
<td>$1,400</td>
<td>$1,000</td>
<td>8.7 months</td>
<td>Proposed</td>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>48,500</strong></td>
<td><strong>1010</strong></td>
<td><strong>$45,400</strong></td>
<td><strong>$136,500</strong></td>
<td>~3 years</td>
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Additional/Possible Future Projects

• **Compressed Air System**
  • Opportunity
    - Air leaks and processes
  • Solution
    - Documentation of usage at in each area
    - Ultrasonic leak tester to detect leaks on fixtures

• **Rinse Water Disposal**
  • Opportunity
    - $2.50/lb to dispose of water which was $26,000 over last 2 months
  • Solution
    - Water treatment system
    - Evaporator
    - Change flux type
Personal Benefits

• Real-world experience and application of education
• Knowledge of lean manufacturing principals
• Independent learning
• Communication with operators and staff
• Communication with other companies
• Teamwork
• Cost/benefit analysis
Questions?