A Project Approach to the Successful Implementation of Robotic Welding Cells

By: Joe Lane, C.I. Manager
In Operation Over 45 Years
Located in West Central Wisconsin
  • 140,000 Square Foot Modern Facility
Employee Owned Company
  • 176 Employee Owners
Manufacturer of Quality “Large” Scale Components, Weldments, and Assemblies
• Primary Industries Served
  • Defense
  • Construction Equipment
  • Commercial Air Conditioning Equipment
  • Waste Water Treatment Equipment
  • Energy
  • Agricultural Equipment
  • Railroad Locomotives
  • Industrial Drive, and Gear Manufacturing
The Project Approach

• D&S Project Standards
  • All projects must tie to D&S business objectives.
  • Manage projects using PDCA.
  • Include/Create a cross functional team right sized for the project.
    • Everyone participates!
• Use Lean “A3” Thinking and Reporting
What is “A3”

• A standardized structure to implement PDCA management.

• A3 reports are named A3’s because they fit on a single side of A3 paper (11x17)

• Promote logical focused thinking

• Essential A3 elements
  • Makes sense to others, not just the team that created it.
  • Visual and concise
  • Direct link to business objective
  • Contains a CLEAR GOAL
  • Aligns effort with objective (goal)
  • Include results tracking
Investment in the Future

New style robotic welding cell to increase welding envelope, capacity, and deposition rate potential.

Installed December 2012

Acquisition Team:
- Scott G.
- Laramy P.
- Dylan S.
- Tim M.
- Katie P.
- Russ B.
- Michael L.
- Mat M.
- Darrell J.
- Joe Lane

Dual Robots

2200# Capacity (2x)
157” between Head and Tailstock
55” Swing Dia.
Project Description: "1000K" Robotic Weld Cell Installation and Implementation

**Background (Business Case)**

1.) Management Goal FY12
   Profitable Annualized Growth of 7%

D&S was awarded a Cab Support structure for XXXXX. FY13 sales forecast $XXXXXX.

The project was quoted robotically welded on a system that is outside of D&S's current robotic envelope and capacity.

**Implementation Plan**

<table>
<thead>
<tr>
<th>Milestone Task</th>
<th>Planned Completion</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create Tooling Specification</td>
<td>6/18/2012</td>
<td></td>
</tr>
<tr>
<td>Concept Tooling Design and Reach Study</td>
<td>7/10/2012</td>
<td></td>
</tr>
<tr>
<td>Final Design Review and Release</td>
<td>8/16/2012</td>
<td></td>
</tr>
<tr>
<td>Define Cell Location and Layout</td>
<td>8/16/2012</td>
<td></td>
</tr>
<tr>
<td>Define Cab Welding Location</td>
<td>9/28/2012</td>
<td></td>
</tr>
<tr>
<td>Outfitting Cell with Robotic Welding</td>
<td>10/1/2012</td>
<td></td>
</tr>
<tr>
<td>Go Live</td>
<td>11/13/2012</td>
<td></td>
</tr>
<tr>
<td>Site Prep Complete</td>
<td>11/23/2012</td>
<td></td>
</tr>
<tr>
<td>Peripheral Equipment/Tools in House</td>
<td>12/6/2012</td>
<td></td>
</tr>
<tr>
<td>Installation and Site Acceptance</td>
<td>12/7/2012</td>
<td></td>
</tr>
<tr>
<td>Process Documentation Complete</td>
<td>1/1/2013</td>
<td></td>
</tr>
<tr>
<td>Operator training documentation updated</td>
<td>1/1/2013</td>
<td></td>
</tr>
<tr>
<td>PM plan documented and in place</td>
<td>1/1/2013</td>
<td></td>
</tr>
</tbody>
</table>

**Current State**

A robotic welding system, capable of welding the Cab Support Structure, was researched and purchased from our robotics integrator on May 25th, 2012. The system is scheduled to be delivered in late November 2012.

**Future State (Goal)**

Successfully install and implement the "1000K" robotic weld cell at D&S Manufacturing. Successful implementation will include:

- Turn key welding of the Cab Support Structure.
- Lean cell layout. (includes part delivery, material handling, tool organization, etc.)
- Work/Fixture holding platform to support quick and repeatable fixture change over.
- Documented Standard Operating Procedures.
- Documented Training Standards.
- Documented Programming Standards.
- Documented Preventative Maintenance Program.

**Follow Up Actions**

<table>
<thead>
<tr>
<th>Task</th>
<th>Completion Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programming group to complete operator training documentation</td>
<td>7/1/2013</td>
</tr>
<tr>
<td>Implement TPM through the cell OMI</td>
<td>7/1/2013</td>
</tr>
<tr>
<td>Develop point of use T&amp;F storage solution</td>
<td>6/14/2013</td>
</tr>
<tr>
<td>Review entire value stream for REC</td>
<td>CI A3</td>
</tr>
</tbody>
</table>
Advantages vs. Disadvantages

**Advantages**
- Best Solutions
- More Productive
- Conflict
- Develop Future Leaders
- “Buy In”
- Empowerment

**Disadvantages**
- Takes Longer to Reach a Decision
- Conflict
- Empowerment
- Loss of Production
Questions?