

Manufacturing Case Study

Integrating two facilities: Technically and culturally

Combining lean thinking and organizational change techniques provided a powerful and effective approach to this company's merger woes. In 18 months they went from *worst to first* in almost all performance measures.

Company Profile

This specialty chemical manufacturing company produces about four million pounds of finished material per year, with annual sales of \$37 million. Its product lines include one- and two-part epoxies and resins, used in aerospace, electronics and other extremely demanding applications. Products are made in 8,600 batches per year, varying from a few gallons to a few thousand gallons per batch. It employs 90 non-union people in one shift in a single 100-year old facility.

Business Challenge

Over its 50 year history, this company had been acquired, merged and divested enough times to have lost sense of its original product lines and culture. With its latest acquisition, two manufacturing sites were merged into one. Though this resulted in immediate operational cost savings, it also caused significant confusion and disorganization – enough to reduce productivity and morale, and increased safety, quality and delivery problems. Over time, these issues became significant enough to erode quality, cost savings and customer confidence, endangering the business' long-term profitability.

Approach

The consultants¹ found a disorganized, dirty facility filled with skilled but frustrated employees. The recent merger had moved all of the material and equipment into the new building but hadn't organized it into an integrated production system. The consultants felt it was important to be successful quickly and to "earn the right" to make longer-term changes, so improvement activities had to begin with whatever was causing the most frustration among employees. Improvement activities would be identified, prioritized and accomplished by the employees. Though much of the management team was skeptical at first, the facility's general manager was an active supporter and participant throughout the process. The consultants worked with plant management, operators and support department to develop and implement a four-phase improvement plan:

Phase 1: Understand and commit to change. The consultants met with groups of managers, professional staff, administrators and operators over the course of a week to discuss their situation, explain Lean manufacturing and develop the topic for the Phase 2 meeting: "What would Lean manufacturing look like here and where should we start?"

Phase 2: Assess current capabilities and agree on the initial steps. The consultants facilitated a two-day, cross-functional meeting of about a third of the plant using the Future Search design. Twelve initial projects were identified by everyone as key areas to begin action for the future of the plant. Examples of these projects include:

- 1) Organize the finished goods warehouse (to speed up filling orders),
- 2) Organize one of the production areas (to improve operator productivity), and
- 3) Reduce the order entry lead time (to gain production time and reduce late shipments).

Phase 3: Establish a foundation and deploy work teams. Because of the fast pace of change, the second cross-functional meeting was held only 30 days after the initial meeting.

¹ Jim Van Patten and Rick Lent

This meeting provided an opportunity to report results and identify the second round of projects, this time with many more people from the plant in attendance. The steering committee decided to launch more projects in every department in the facility and to further explore Lean – especially “pull scheduling” — in a second production site. The consultants were asked to return to assist with three projects: 1) developing a “focused factory” with pull scheduling, 2) developing a “self-managed work team;” and 3) developing internal facilitators. Projects were completed over the next 2-3 months with periodic cycles of meetings across the teams to review and reflect on what they were learning about creating change.

Phase 4: Expand on the foundation. Driven by the plant manager and managed by the steering committee (with very little involvement from the consultants):

- The discipline known as “5S” was implemented throughout the facility. It has reduced office space, lab space and warehouse space to make way for additional production equipment. The product line was trimmed from over 3,000 products to 1,800.
- Initial experiences were used to plan and implement a new Lean production area and self-managed work team. This area became the prototype for all future production.
- Lean requirements for suppliers were negotiated into agreements so that small, frequent shipments and consignment inventories became the norm.
- The facility has a yearly improvement plan that specifies projects to be conducted and their expected results. The ability to work in cross functional teams and continuously review results against plans had become standard practice.

Resources and Results

In less than two years, with little additional consultant support, the plant achieved the following results:

Measureable	Project Start	3 Years Later
Safety, Health & Environmental <ul style="list-style-type: none"> • OSHA Recordables • Hazardous waste produced 	11/year 7,675 lbs./year	0/year 2,900 lbs./year
Quality <ul style="list-style-type: none"> • Batches right first time • Customer issues per million 	89% 1,900	93.4% 1,100
Productivity <ul style="list-style-type: none"> • Batches per operator per year • Number of operators 	154 48	232 45
Delivery <ul style="list-style-type: none"> • On time in full shipments • Order to delivery lead time 	92% 15 days	96.8% 5 days
Financial <ul style="list-style-type: none"> • Working capital as a % of sales • Inventory turns 	21.3% 4.5	9.9% 16.9