Batesville Casket Company Manchester Operations 2006 AME Award of Excellence Winner

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inning the AME 2006 Award of Excellence was not a sudden achievement for Batesville Casket Company's Manchester, TN operations. The drive toward becoming lean began more than ten years ago, and like most conversions, the heart of the story is human change, warming both staff and workforce to take it seriously. At the outset, Batesville Casket had a corporate directive to get lean, along with some directives on how to do it. United Steel Workers Local 9137 and many of the staff greeted this with about the same receptivity as most corporate directives.

In Brief

Batesville Casket is taking the slow, culture-building road to process excellence in a mature union plant. Now more than ten years in their journey, the outstanding feature is Creativity before Capital; process kaizen eliminates the need for much capital. Manchester has a strong quality orientation in a business in which high quality is a marketplace must. A story old union shops can relate to. The forward ooze began in 1998 when a revamped Batesville management team realized that all implementation is local. To change the local work culture, leaders on site have to work with the people there, area-by-area, work station-bywork station, and person-by-person. They called that change in perspective, *"A New Beginning."* All rivers have similarity, but every rock in the water is unique to that river in that spot.

Plant Manager Mary Jo Cartwright and everyone on the Manchester team say that their journey will never be finished. Problems to be overcome are endless, but the team relationship among everyone at Manchester is like day and night compared with ten years ago, and especially, with 21 years ago, when the workers voted to unionize. During their journey, Manchester leadership evolved the guiding principles in Figure 1. When read, this list seems like platitudes, but the people of Manchester now live by them.

Developing People

To make lean a way of life, the leaders at Manchester took time to bring everyone together as One Team. Previously, management had not always stayed the course, so to demonstrate seriousness, early change emphasized safety and ergonomics. As work life improved, associates gained confidence that lean is not old-fashioned, despised speed-up.

Today, Manchester is proud of its safety record. And the safety program had side benefits for both productivity and quality. Being more careful at work, doing things "the right way," made people more careful building the caskets "right" too.

The One-Team feeling requires management to constantly communicate by any means available: regular meetings, biweekly round tables, union leadership meetings, copious postings, and quarterly *We Care* surveys. Everybody gets a birthday card, for example; "little recognitions" add up. Management takes pains to tell people bad news as well as good, and promptly. On both shifts, every supervisor has a Daily Continuous Improvement Meeting in a break area, as shown in Figure 2. Communication consumes most of the time of Mary Jo Cartwright, the plant manager.

In the 1980s, Manchester's myriad job classifications made people wait on each other to do their bit on a task. About 40 job classifications remain, but the waiting has nearly stopped. All associates must be able to perform all the jobs in their area. That not only permits job rotation to help prevent ergonomic problems, but multi-skilled workers can fill in for anyone else absent on a team. Time off has long been regarded as an entitlement for those working at Manchester, so absenteeism is high. On some shifts supervisors struggle to allocate available people to jobs. Fortunately however, many associates have experience in multiple departments, so they can cross between departments. The average age is 45. Manchester achieved this increase in flexibility without negotiating a specific pay-for-knowledge component into the pay system.

- Never compromise on safety
- Treat people with dignity and respect
- Diamond standard quality
- Lean manufacturing principles
- Creativity before capital
- Repeatable, reliable processes
- Making fact-based decisions
- Keep it simple
- Just do it
- Make tomorrow better than today (for customers, associates, Batesville Casket Company, and all processes).

Figure 1.



This meeting lasted about five minutes. Safety and quality announcements, as always, led off the meeting, followed by updates on special orders or machine conditions. The primary question was what time they might finish. If Manchester casket completions get behind the number of units scheduled by takt time, they may work overtime to finish "must do" orders.

Figure 2.

A Typical Daily Continuous Improvement Meeting at Manchester-Batesville

Batesville Casket Company Manchester Operations

The Manchester Operations are part of the Batesville Casket Company, wholly-owned by Hillenbrand Industries, Batesville, IN. Hillenbrand also owns Hil-Rom, a well-known manufacturer of acute care hospital beds. The casket company is descended from the Batesville Coffin Company founded in 1884.

Today Manchester is one of six Batesville Casket Plants; four in the United States, and two in Mexico. Opened in 1970, the Manchester property is huge, 169 acres, with 428,000 square feet under roof. Manchester produces standard-size 18 and 20 gauge steel caskets, 1200-1400 units per day. There are 207 total models in 22 base colors. The hourly workforce has been represented by United Steelworkers Local 9137 since 1985. The total workforce is 493 people, of whom only 40 are exempt staff and management. Each supervisor averages 34 reports.

Manchester primarily produces to stock. The site is also home to one of seven Batesville Distribution Centers, plus a partnership logistics operation. The distribution centers feed about 80 local customer service centers nationwide. Funeral directors are the primary customers. Batesville Casket caters to the 75 percent of funeral homes that are independently owned, and to customers that prefer quality products and quality service at a competitive price.

Widespread distribution is important for prompt delivery. When a funeral director calls for a particular casket, delivery may be wanted next day. Almost any casket can be built in a few hours, but shipping time from a plant to most locations is too long. Manchester's schedule must promptly replace items taken from stock. Despite needing to stock a full line of finished goods, corporate inventory turns are about ten, and Manchester has three-to-four days of WIP and raw materials.

The casket market is flat. Dying, fortunately, is not a growing business. The cremation ratio is up to about a third, slowly rising. This squeeze presents a strategic conundrum. Batesville prefers to sell more caskets by beating competitors on quality, delivery, and service. Besides caskets, Batesville has an Options[®] line of cremation products, funeral home retail displays, and software including funeral planning packages. Manchester supports about 155 field representatives engaged in personal relationship selling. It has learned to do this so well that in 2004, it was one of *Industry Week's* Ten Best Plants.

Over time many workers came to like kaizen. Many now consider it an honor to be on a kaizen team; a few really eat it up. Mechanically minded, they like devising ideas and devices to make things better. Most why-didn't-I-think-of-that ideas come from the floor.

Kaizen activities reduced stock. Cells and one-piece flow additionally shrank the manufacturing floor space. The big old plant now has huge swaths of unused space, even after converting some of it to the distribution center. Manchester is looking for a new complementary product to take on to absorb space, and to provide more jobs, for no one is laid off because of kaizen. After productivity rose dramatically, many extra people were slowly dissipated through attrition, but they would like the entire floor space to hum with activity and became a source of new jobs in the Manchester area.

Creativity Before Capital

This catch phrase in the list in Figure 1 is considered the most significant ongoing benefit of lean manufacturing. "Keep It Simple," and "Repeatable, Reliable Processes" are also part of the spirit. The basic idea is to never spend money on new equipment or expensive fixes until a process has been thoroughly worked over by kaizen. Avoid spending money unnecessarily.

This idea was also partly driven by the need to reduce the number of lost cycles in production. A lost cycle is time that could have been used to make a casket, but for whatever reason, it did not get done. Quality problems were part of the reason, but the big one was unreliable equipment. Manchester started getting rid of expensive machines, hard to maintain, that seemed to break down at the most inopportune moments. An intriguing example of this, shown in Figure 3, came out of a kaizen effort to reduce the setup time for a roll former making brackets. Coils had to be mounted on a de-coiler to unwind into the roll former — or they thought they did — and this required a lift and eight minutes of downtime between each coil. Upon thinking about this, operators and engineers figured out how to just uncoil from the pallet without the thing twisting into a knot.

Tried the idea, and it worked; got rid

Example of Creativity Before Capital: Eliminating a De-Coiler

of the de-coiler, the cage around it, and the lift. Now a new coil feeds through the process attached to the butt end of the old coil, with little or no downtime. Even duct tape is sufficient to tack the two coils together.

In addition, the same project established fixed stops for the length of different brackets so the time to measure and adjust length during changeovers from one bracket to another was eliminated. Here are three more ideas:

<image>

Before:

Coils were changed on a de-coiler. Averaged eight minutes of downtime between coils, and the de-coiler required a guard cage; needed a hoist to lift the coils too.

After:

Figured out how to un-coil straight from the pallet without the strip twisting. Seldom have downtime between coils. Even duct tape will hold the feed end of a new coil to the butt end of the old one to feed through the press. A capital request was unnecessary.

This was part of a setup time kaizen. Besides eliminating the de-coiler, the kaizen also greatly reduced the time to clean loose dirt from each new coil and fabricated stops for the different lengths of angles to be crimped, thus eliminating measurements to set up for each new length.

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- Automatic tape dispensers were installed just above the casket body rim moving on an assembly line. The tape is adhesive holding the insulation strip between the body and lid of the casket. This eliminated a human process not easy to replicate time after time, and it cost practically nothing, \$500.
- Space-eating conveyors feeding attachments to casket assembly were eliminated. Just put the attachments in the moving casket body. It's a good box for holding things.
- A simple chain and pulley arrangement pulls caskets to the rear of trucks after loading them in the end of semi-trailers. It takes less time and labor to load, plus a trailer can be loaded without being parked at a dock. Because of this, no new docks needed to be built.

The Manchester plant does not display any advanced automation. Even in the paint department, simple devices do the work that many companies would use robots to perform. Robots weld casket seams; they don't get tired or become distracted, so consistency improves. Some pick-and-place robots position material. And that's about it. Before buying a solution to a problem, Manchester mandates that a process go through kaizen to find a simple alternative. Usually, the kaizen team finds one.

Management can make a rough estimate of how much money has been saved by this, but it is nebulous. You don't know how much was saved if no thought was given to buying a solution; you just did it – solved the problems. And the big problem was unnecessary downtime due to unreliable equipment.

Preventive Maintenance

Planned maintenance is now regularly over 90 percent of the total, which means that reactive maintenance is less than ten percent of the total — outstanding. However, Manchester's preventive maintenance is not complicated. It was boosted considerably by replacing or simplifying equipment until it became more reliable. The theory is simple. Equipment less complex and easier to access is more likely to keep running, easier to fix when it isn't, and if it is strictly mechanical, it usually gives early warning of a problem. Much of the time an attentive operator senses when something is working improperly, or starting to wear. Just respond to early warnings, perform anticipatory maintenance, and over time, the system creates its own data for routine scheduled maintenance.

Operators do routine maintenance, cleaning, and lubricating, for instance, but don't tinker with machines if it takes much more than a screwdriver. Maintenance personnel pull most of the routine repair/replace work. Tool and die makers take care of the dies, but rarely build a new one — takes too much of their time. Crossfunctional kaizen teams look for ways to make the equipment simpler and safer. Just do it (or do-it-yourself) is now embedded in the work culture. The workforce knows that little ingenious ideas are the key to keeping work in Manchester.

All this simplification improved quality too. Fewer process interruptions and workarounds automatically have that effect. In general, Manchester's lean initiative has the effect of simplifying things so that there are fewer opportunities for error.

Diamond Quality

Batesville Casket depends on quality of service as well as product for marketing advantage. Manchester Operations has the best quality of its sister plants. They attribute this partly to the rigor of their Diamond Standard audits.

At Manchester, quality is built-in, not inspected in. Fail-safe and associates' checks while doing the work assure quality up to the point of doing a pressure test to check weld integrity of an assembled unit. The next check is the finish quality of a completed unit. The exact color is quantified by matching a spectrometer reading with a standard color spectral profile, so color is not judged from the eyes of humans whose aesthetic perceptions may vary.

A Diamond Standard Audit at Batesville Manchester Operations

This final check is under white lights, somewhat as the final visual inspection of a car just off the assembly line.

Only after all this is done are a few caskets randomly pulled from finished units, ready to ship, and subjected to the Diamond Audit. Auditors check dimensions, color, general appearance, and for flaws whether they appear in a "spec" or not. They look for tiny scratches, imperfections in metal forming, traces of weldment, or anything else that might attract the eyes of anyone staring at a casket with a loved one in it for a long time. It has to be "just right."

Most audits are performed by managers. Feedback is quick, both to the quality system and when helpful, directly to associates. The Diamond Audit area is on the shop floor, so it is easy to have associates come by and begin to run through "why" questions immediately. Manchester credits their quality performance to this rapid feedback of "picky squawks" to the manufacturing process. Nothing ships unless it is just right. Customers are almost always funeral directors, and indirectly, of course the bereaved families who are the funeral directors' clientele. In the past year, "customer disappointments" for any reason were 1179 ppm, and many reasons occur after the casket leaves Manchester Operations. The goal for 2006 is to cut customer disappointments to 888 ppm. So far they are ahead of this goal.

All managers perform Diamond Audits at least once a month. Some do audits more frequently. Besides the fast feedback to operations, this exercise certainly sharpens all managers' eyes for quality. With the Diamond Audit station on the shop floor, no employee can miss the importance of the Diamond Audits, so it sharpens their eyes for quality too.

Evolution of Lean at Manchester

Changes did not occur quickly and painlessly at Manchester. Twenty years ago, union associates and management were often at loggerheads, so big changes in this relationship were needed before



Scott Brothers performing a Diamond Standard Audit at Batesville Manchester. He's measuring the lap length of the lining cover over the lid. Auditors perform many measurements, and are sticklers for general appearance.

Figure 4.

people gained confidence and became ready for more aggressive stages of process improvement. Transformation took place in a progression that roughly parallels Figure 5. The phase emphasizing safety and ergonomics lasted several years. Only after the workforce understood that this was a serious long-term effort from which they were going to benefit, could Manchester begin to undertake kaizens that required their input.

The second stage began around 1999, as Manchester developed the emphasis on reducing lost cycles, and the pattern of kaizen activities that led to capital avoidance by substituting process improvement for capital spending. That, coupled with tightening the quality expectations, led to the state of Manchester today.

As the flow streamlined and floor space shrank, hours per unit dropped. The plant cost per unit dropped in almost the same pattern. Improvements more than offset the added cost of steel the past two

— Lost Cycles — Hrs/Unit — LWDI — Cost of Q



All figures are indexed to show improvement from the "peg in the ground" on each measure before starting sustained kaizen. Key:

Lost Cycles: Of all takt time opportunities, the number times Manchester failed to complete a casket. Hours per Unit: Labor productivity is based on total site headcount. LWDI = Lost Workday Incidents; One a year or fewer since 1999. Cost of Q: Manchester better labels this as Cost of Quality Non-Compliance

Figure 5.

years, and many more kaizen opportunities beckon. For example, the grinding of casket covers needs attention; steel handing around the presses needs it too. The more kaizen they do, the more opportunities they see. That, and constant development of all associates and constant communication with them, is what it is all about. They keep thinking broader and deeper, and more as One Team, following that last platitude in Figure 1, "Make Tomorrow Better than Today."

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