

# The Conversion and Journey of **Brad Hart**

Brad Hart is the president of **Roberts Tool Company Inc.** (Chatsworth, CA), one of the earliest aerospace industry suppliers to embrace lean production. Always specialists in producing highly complex machined parts, the company began to reform its production system on the lean model in 2000. In the years since then, Roberts Tool has tripled its sales and, as he explains below, Hart himself has become a board member of the aerospace primes-initiated Supplier Excellence Alliance and a “poster boy” of aerospace supplier lean production. *Aerospace & Defense Manufacturing* asked Brad Hart to share the details of his journey.

**Aerospace & Defense Manufacturing:** Could you walk us through your company’s initial move to lean manufacturing?

**Brad Hart:** One of our customers, Parker-Hannifin, introduced the “Lean” initiative to us in 2000. As a result, we hired their Lean guru from their Ogden, Utah division. For four years we flew him to Southern CA, put him up in a hotel, and flew him home every Friday. People always ask, “Wasn’t that expensive?” Absolutely it was, but, with his help, we’ve tripled sales since 2000. Sales per employee have doubled and inventory turns have gone from 3 to 11. It was one of the best investments we’ve ever made.

**ADM:** Back in 2000, did you ever feel like you might be walking off a pier, making this leap into a completely different way of doing things?

**HART:** Change is always a little intimidating, but I think the lean approach rang a bell with me because I’m not a machinist. A lot of machine shop owners start out as great machinists; they proceed to buy a few machines and the next thing you know they’re a business owner. I have a degree in mechanical engineering, but I’m not a machinist. So I was more interested in documenting and standardizing the machining processes. This allows us to leverage the skills of our key employees; making all of our employees more productive. Other machine shop owners intuitively know they can go out on the production floor and do a job themselves. Because they—other owners—have this ability; having documented, standardized processes may not seem as important to them as it does to me.

I do believe the value of RTC [Roberts Tool Co.] is higher as a result of standardizing and documenting the processes. This ability to capture intellectual property makes your revenues more repeatable and reliable. In a machine shop, this is easily your most valuable asset. With most machine shops, if the owner walks out the door, most of the intellectual capital walks out in his head. Putting all those key processes in place and documenting them, and training the people, represented security to me.

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**Brad Hart**

ADM: Can you describe how you make a part now, compared to how you would have done it in, say, 1999?

HART: We have a complex hydraulic pump component, for example. In 1999, this part would have required one of our best machinists several weeks to set up and prove out before starting production. Three months later we would repeat this process. We were essentially reinventing the wheel each time we needed to run this part. It always required one of our very best machinists, it always required several weeks, and there was never a guarantee that the resulting parts would turn out the same.

**"The stability of my customers is dependent on the strength of their supply chain. The stability of my company is dependent on the stability of my customers."**

Currently, we run these parts in a cell. The setup only requires two hours and is performed by a well-trained cell member. Prior to the cellular work environment, these parts required ten hours of machine time with a lead time of about 18 weeks. We now produce a finished part every 40 minutes out of the cell, and the lead time is reduced to several days. The cell also produces identical parts with little or no scrap. The fact that we can produce a complex part with only two hours of setup also means we can produce small lots and deliver when the customer needs them. With a two-week setup, we always tried to run as many parts as possible, creating inventory.

This process improvement allowed us to reduce the customer's price by 30%. As a result of that price drop, the cus-

tomers was able to sell them to Airbus as well as Boeing. The bottom line is that we are making more money, at a lower price, than we did before.

This is the key. Providing your customer better quality parts, in days instead of months, at a significantly reduced price, while making significantly more money.

It is easy to understand why the Industry is supporting Lean. This can be a winning recipe for everybody, but everybody needs to participate. That's why I'm encouraging Lean along with SEA. The primes need their entire supply chain to embrace lean to make a real difference and

strengthen the industry. Roberts Tool Co. does its part by giving tours and promoting Lean and SEA to as many people as possible, including our competitors.

ADM: To clarify, you're saying it is in your best interest to promote lean manufacturing, even to your competitors, because—

HART: Well, it's really about our customer's supply chain. The chain is only going to be as strong as the weakest link. I'm only one of those links. It is in our best interest for the rest of their supply chain to be equally as lean. The stability of my customers is dependent on the strength of their supply chain. The stability of my company is dependent on the stability of my customers.

ADM: Tell me more about your manufacturing cells.

HART: Our manufacturing cells are low-volume, high-mix, and produce complex parts from castings and forgings. The ability to reduce or eliminate setup, match cell capacity with customer demand, and balance operations within the cell are all keys to a successful manufacturing cell. In the long run, it is a culture of continuous improvement that is most important. A workforce that understands the power of lots of small incremental improvements is invaluable.

The move to cells has significantly increased our quality and improved our delivery. In the past, we were unapologetic for our poor delivery and quality. Our attitude was, "Hey, we got the hardest parts, nobody else can do them, what do you expect?" Since our parts were complex and the customer kept giving us orders, we assumed this was acceptable.

Currently, we are delivering 93% on time and our quality is 99.5%. This improvement is a direct result of our manufacturing cells. These cells are not about the fanciest new equipment. It's really about using the right equipment in the right place—ideally, its inexpensive machinery.



**The newest manufacturing cell at Roberts Tool Co. is made up of four identical milling machines. It produces a finished complex part every 40 minutes.**

ADM: The "right-sized equipment" idea.

HART: Exactly. Now, the machinery dealers want to sell you a million-dollar cell with all the bells and whistles that, you know, lets you change jobs in your pajamas at home. But you have to pay for that. We're trying to do the equivalent production and quality with equipment that costs half of what they're offering.

ADM: Are you finding it easy to find or create the smaller, simpler type of machine you want?

HART: We've purchased a lot of Haas Automation machines and they're a good fit for building cells. We can purchase four of these machines for half of the cost of a fancy machining center. As a result, we purchase four at a time and create a cell that supports our high-precision, complex machined parts. We do have some of the fancy machining centers, which we were able to acquire at 'distressed' prices: I was able to buy equipment when nobody else wanted to. These machining centers don't, however, reflect our philosophy on lean, which is "the appropriate and least expensive equipment to do the job."

ADM: Are there situations where the fancier machine is of use because, say, you have a very few number of parts that you're running, or—?

HART: Yes there are. We use a single-spindle machining center to do the jobs that are extremely complex and have long setups. In the past, the setup might be 70% of the time needed to make the part. It might take you a week to set it up and then one day to run the job. Filling up the machining center with jobs of this nature allows us to run a different job every day with no setup cost. That is highly profitable and is a good use of these machining centers.

ADM: But that's no longer a big percentage of your work week.

HART: That's right. We determine the size of the cell based on customer demand—that is, takt time. The cell needs to be able to produce parts at the same rate that the customer requires those parts. To support a family of parts and larger quantities, a multi machine cell is usually the best approach. The material goes in one end of the cell and comes out of the other end, a completed part. It is a continuous, constant flow.

ADM: You are now on the Board of Directors of SEA—the Supplier Excellence Alliance.

HART: Yes, I am.

ADM: You had already been exposed to the whole lean philosophy, first through your customer and then through your consultant. How—and why—did you get involved with SEA?

HART: When they presented their concept to me, my initial response was, "No, we don't need that. We're way past that." After some thought, and a better understanding of the program, I soon realized that they have a great step-by-step recipe for the lean journey. The SEA model is structured to enable an organization to obtain and realize lean, using an easily understandable process. We spent five years implementing lean; using the SEA model we could have accomplished the same implementation in three years.



At left are the stainless steel raw castings for two complex hydraulic pump components, prior to being machined in the cell. On the right are the finished parts.

I've embraced SEA. I've modified my business model, metrics, etc. to reflect those encouraged by SEA. As a result, my visibility with the primes has been elevated tremendously. They're using RTC and other SEA companies to set the lean standard for the supplier base. The primes want their suppliers who have stepped up to Lean, to share their resulting success with other suppliers in an effort to convince them that lean is the way to go. When I'm sharing my success story with other suppliers, they realize that I have nothing to gain personally whether they sign up or not. I think this carries a lot more weight and has a greater impact coming from me as opposed to a customer. So, my role in SEA is to help facilitate that educational process with suppliers.

But back to the SEA model; using it has proven to be much more cost-effective and timely. My costs for a professional consultant, his travel expenses and other associated expenditures cost us at least a half a million dollars. I could have accomplished the same thing for 20% of that had I utilized the SEA model from the beginning.

ADM: You go out, then, and make these presentations to other machine shops? What kind of response do you get?

HART: The response has been mixed. I always assumed everybody in the industry would quickly move to the lean model. I've learned that change is a tough sell. I've made presentations and shared my story in front of 40 or 50 Boeing suppliers at a time, and you'd be surprised. They're not all jumping on this as I had anticipated. I keep preaching to them: "You are going to do this. You're either going to be first, and make a lot of money, or you're going to be last, and you're going to do it to survive." →