

Advanced Multi-Tasking Knocks Out Competition for Valve Manufacturer

Try this problem on for size. Let's say you're an old-line valve manufacturer with a plant full of manual turning and milling equipment. Further, let's say you have a great reputation with all your customers in a broad range of markets. That's because you make very high quality valves. Even so, once in awhile some of your valves do come in for repair, but only after fifty years in rigorous service.

You're proud of your products, your services, your people. You have a steady six or seven months' backlog of orders. Lead times are stretched out about as far as they can go. Then, a few years ago, the rules changed.

Your competitors started buying CNC equipment. The Chinese and other low-labor-cost regions got into the game. With CNC on the scene, you no longer had a corner on producing quality-machined parts at reasonable prices. And, when that happened, your customers suddenly began shopping for products with the shortest possible lead times and the most competitive prices. A big backlog was no longer something to brag about, but something to worry about.

The bottom line: if you didn't find a way to slash your costs and delivery times, the competition soon would be having your business for lunch. So, here's the question. What would you do to stay in the game?

"That's a pretty good summary of the way things were," says Michael Castaldo, machine shop manager at the Cla-Val Newport Beach, CA facility, "and for a while, we were a bit nervous

about the situation. However, we did something about it. Basically, we found a way, not only to stay competitive, but to get way ahead in the game as well.”

Valves, Valves, Valves

Cla-Val is a 65-year-old manufacturer that designs and produces valves for fire protection, water works, aviation, ground fueling, marine, industrial waste, and numerous other applications. About 35% of its annual sales go to government applications; the balance is sold for commercial use. Forty percent of its products are standard, off-the-shelf designs, the rest are what Castaldo calls “specials,” which means Cla-Val customers call in with custom valve requirements and company engineers design them a solution. Cla-Val’s machine shop then has the task of producing the valves and shipping them on time. Valve sizes range from as small as 3/8-in. all the way up to 24-in. Most valve components are produced from precision castings delivered from Cla-Val’s own in-house foundry.

“Altogether, we have about 50,000 parts to track and produce,” he explains. “Most of them are for what we call forecast products, which are standard, off-the-shelf valves. It’s the ‘specials’ that give us headaches, however. We get orders for custom valves. That means design, programming, rapid turnaround, and delivery to meet customer demands. It means a lot of fast-turnaround short runs. And, with the highest percentage of our sales in specials, that puts a lot of strain on the shop. To stay competitive, we set our shop goal to attain the fastest delivery possible. For us, throughput is now king.”

Like many successful old-line companies, Cla-Val had found a formula that worked well. It had a highly experienced team of manual machinists, who had served the company loyally for years, and who had learned to produce very high-quality parts that lasted for decades. Also, like many old-line companies, Cla-Val was somewhat conservative about changing its success formula too quickly. When it changed, it wanted to do it right.

“We have been studying the notion of multi-tasking for a number of years,” Castaldo, who has been with Cla-Val for 25 years, says. “Some of the parts we make required as many as 14 or more setups on manual equipment to complete, and we knew we had to do something about that. Here in Newport, it’s always been manual equipment. We started buying CNC equipment only about eight or nine years ago, small stuff, like two-and-three-axis machines, bar feeders, and so forth. But about three years ago we realized even that wasn’t sufficient. We needed something more. We needed to make a major move into multi-tasking machining.”

Castaldo’s team spent a lot of time analyzing their requirements and looking at equipment solutions. “If at all possible, we wanted to take those parts needing 14 setups and do them in one or two,” he says. “We found a lot of good equipment out there that could do the job for us, but, like most other companies these days, we didn’t have an unlimited budget. We needed to get a lot of machining power for the least amount of money. We finally settled on buying a Integrex 300Y multitasking system from Mazak Corp. (Florence, KY). There were other machines on the market that could do more than the Integrex, but the 300 Y did everything we needed to do at about half the price. That sold us.”

Afraid at First

According to Castaldo, both he and his employees were a little afraid of the machine at first. “Actually, we were scared to death,” he recalls. “We had never had anything close to this technology on our floor before, so in the beginning it was very intimidating. But with Mazak’s help, in no time it became our best friend. Within a week or so, we had more work for it than there were hours in the day.”

What makes the Integrex a multi-tasking machine? “Well, it’s designed specifically to do just about everything you can imagine to a part in one setup,” says Castaldo. “It has two spindles, one 3500 rpm, one 10,000 rpm. It will do your turning, your milling, your angles, anything you can think of. You can interpolate, you can proof from the milling side or the turning

side, and for us the most important feature is the machine's offset capability. It has 225-degree B-axis positioning in 0.0001-degree increments. It can go from 30 degrees above the spindle centerline on the number-one spindle side to 15 degrees over centerline on the number two spindle side. That gives us tremendous versatility. We can go up and do the turning by milling, if we want to, plus a lot of other applications. That was huge for us."

As much as Castaldo likes the Integrex, he says he made a mistake when he bought it. "The machine comes with options for 20, 40, and 80 tools, and I bought the 40-tool ATC. I should have purchased the 80 right off, but we learn from our mistakes. We just bought another one, this time with 80 tools."

With Mazak's programming assistance, Castaldo immediately put the the Integrex to work on a newly designed pit valve used for aviation ground fueling by the U.S. Air Force. Using his older procedures, the part would have been costly with multiple operations. "Those valves are 4D parts, which I don't think we could have made in house before the Integrex," he says. "Certainly they would have been expensive to make with 12 to 15 operations. Now, however, we're doing the part in two ops. We ended up with hundreds of parts we wanted to put on the 300Y, which is why we just bought a second one with an 80-tool magazine."

Stepping Up

Based on his success with the Integrex 300Y, Castaldo started looking for something with a much larger work envelope to handle bigger valves. "We needed something to do our 12-in. valves on, but we also wanted to have all the advantages of Integrex multitasking capabilities," he explains. "So, we looked around , and decided to go with Mazak again, this time with the Integrex e-1060V6. What we do is take on the biggest chunk of manufacturing costs, find a way to reduce them, then when we have that solved, move to the next biggest chunk, and so forth. This time it was the 12-in. valves' turn."

The high-tech six-axis Integrex e-1060V is what Mazak calls “a complete fusion of information and manufacturing technology.” It has a columnar design for ease of access and operation, plus it offers high-speed machining and a rotating B axis. A key feature is what Mazak calls the e-Tower, a communication center capable of two distinct series of functions: (1) providing management information about the machine and production performance; and (2) offering a combination of built-in voice and video training tools to reduce the learning curve significantly.

“I’m in love with the 1060V,” says Castaldo. “Our goal is to cut costs. With the 1060’s dual pallets, we literally have no downtime for setup. We load one pallet while the other one is being machined. When that pallet is done, the machine takes in the next one and goes to work.”

Before buying the e-machine, Castaldo asked Mazak to prove to him that it could do what the company claimed. He gave them a complex part to machine in two setups and they did it while he watched. “It was another one of those 10-to-12-op parts,” he says. “The 1060 does them in two. That’s great.”

What about maintenance of the big machine? “The way maintenance works on the 1060 is another great feature,” says Castaldo. “For example, one month after we got the machine, we got ourselves in a jam, and needed to call Mazak to come over. But then my guys went to the e-Tower and they found a maintenance training simulation that walked them step-by-step through the steps needed to fix the problem. It turned out that we didn’t need Mazak at all. They had anticipated what we needed and built it into the e-Tower. Our people love it.”

“To be honest, it’s getting harder and harder to compete with the low wages in China and other areas,” says Castaldo. “As far as I can tell, the only way for us to compete is to use multitasking to cut our costs to the bone.”

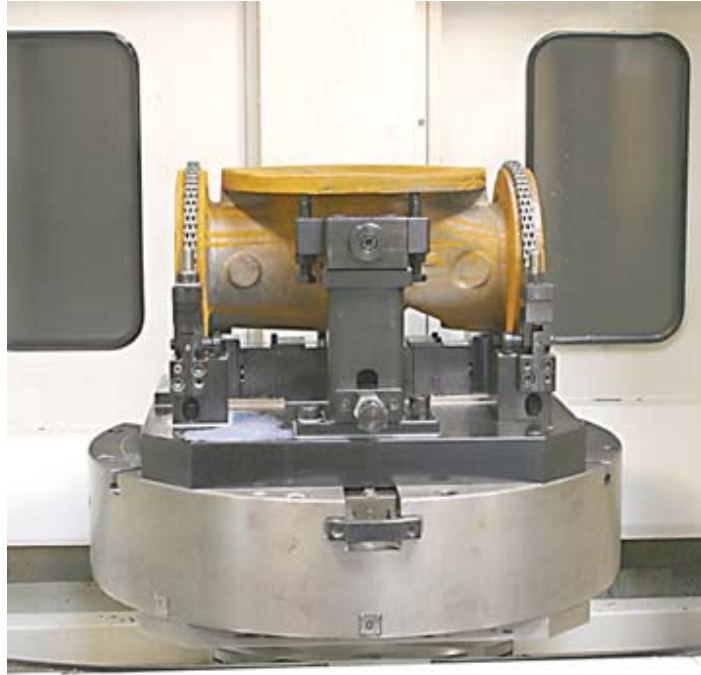
CAPTIONS: *Lien Le, programmer, sets up a ballast-valve part to run on Cla-Val's new Integrex e-1060V, 6-axis, dual pallet machining center.*



Cla-Val machine shop manager, Michael Castaldo, right, and Lien Le, programmer, discuss troubleshooting setup on the e-1060V's 80-tool ATC. The e-Tower serves as a management information and training center for Cla-Val employees.



View of one of two pallets on the Integrex e-1060V. Here is shown a 3-jaw, self-centering chuck holding a ballast valve body produced from a Cla-Val casting.



Robert Rosa, CNC lead person, checks a valve nozzle component produced on one of Cla-Val's two Mazak Integrex 300Y multitasking machining centers.

