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Women Trailblazers in Advanced Manufacturing

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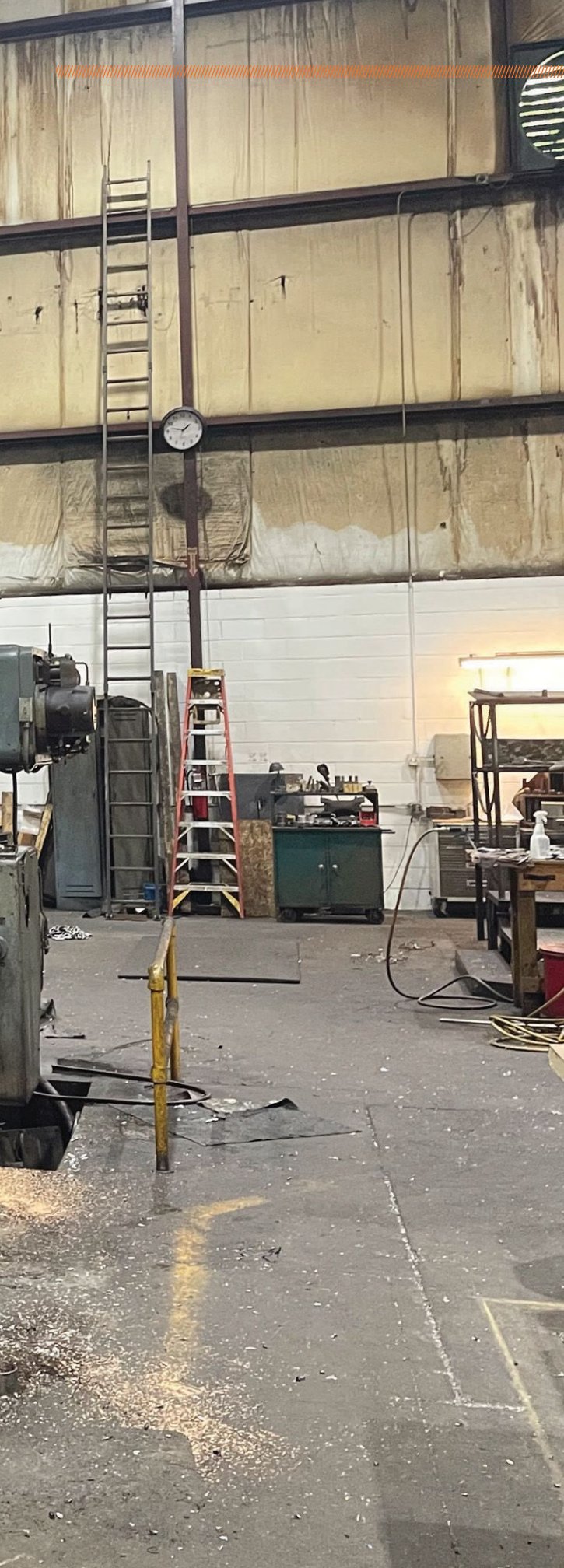
Once machine tools reach middle age, it's definitely time to say goodbye. (Provided by Standard Machine Inc.)



Time to Say Goodbye?

Kip Hanson
Contributing Editor

With a little luck, each of us will grow old and retire at some point, preferably in reasonable health, our wits about us and with enough money in our pockets to live comfortably until whatever comes after. Should CNC machine tools get a similar shot at the golden years?

Humans and machinery share many similarities. Both tend to lose a step the older they get. The frequency of unexpected breakdowns increases, as does the occasional leaky gasket. So who would you rather bet on in an arm wrestling contest—an Olympic weightlifter or a card-carrying member of the AARP?

The Seven-Year Itch

Looked at differently, are you one of those who faithfully trades in the family car every 60,000 miles, or someone who waits to see how many times they can roll the odometer over to 00000? Except for Uber drivers and over-the-road truckers, most vehicle owners don't look to their wheeled wonders as a revenue source.

Lower fixturing costs, higher part quality, less work-in-process—what's not to like about a multitasking mill-turn lathe? (Provided by Ellison Technologies)

That's not the case with CNC machinery, which in most manufacturing environments must be kept fairly current if the job shop or OEM that owns it wishes to continue making money.

"We have a customer in northwest Iowa who replaces his machines every seven years, if not sooner," says Brad Woody, executive vice president for Ellison Technologies Inc.'s upper-Midwest sales area. "By keeping up with technology, he's found himself more competitive than the shops that hang on to their equipment past its prime. Further, his maintenance costs are practically nil, and the residual value of his trade-in is much higher than it otherwise would be."

Strategies such as these are designed to maximize profit, Woody notes. Machine tools are income-producing assets, and the decision-making process must be based on one basic principle: By staying ahead of the curve, equipment owners stand the best chance of keeping their customers and employees happy, their costs low and quality levels high. Sadly, though, customers like those in Iowa are in the minority—Woody estimates them to be about one-third of his base.

But he is not being critical of those who take a different path. Far from it. Woody has great respect for the entrepreneurs who one day decided to put their money where their mouth is and start their own machine shop.

He recognizes that some business owners want to achieve a certain sales volume or employee headcount and stay there, content with the status quo. And OEMs might be perfectly fine with older, less productive equipment, knowing that machined component costs are often just a small fraction of the total value stream. But for shops with revenue streams based on cranking out precision parts all day and wish to see continued growth, keeping up with technology is paramount.

"For the typical job shop, the equation is quite simple: You have to deliver on time, make good parts and offer competitive pricing," Woody stresses. "That's how you become successful, and to accomplish all that most effectively, it means periodically replacing your equipment."

Not the Family Car

Part of that journey begins with a truthful assessment of overall equipment effectiveness (OEE). Too many shops lay claim to levels of 70% or higher when the reality is perhaps half that. Their calculations don't include quality levels or optimal cycle times, and while some might base their OEE on 24/7 availability, most choose to take a more generous approach and measure it according to their payroll hours, i.e., how many shifts they operate.

"We have a good friend who owns a shop and states what many might not want to hear," Woody continues. "We're in a global economy and are therefore competing against manufacturers that operate 24 hours a day, seven days a week. That's the correct time metric, even though most shops don't apply it that way."

Similarly, many machine shops take a cookie-cutter approach to their equipment purchases. They started the business with a three-axis vertical machining center

and, pretty soon, have half a dozen such machines, all lined up in a row and all providing somewhere near the industry average of 35% to 45% spindle utilization per shift. As a few shops have found, however, a properly tooled horizontal machining center and pallet pool can often provide equivalent throughput.

The same math applies to CNC lathes. By upgrading their two-axis, 8" (203-mm) chuck machine to a mill-turn center or ATC-equipped multitasking lathe, efficiency and part quality improve, costs fall and employees can spend more time on value-added activities.

"I can make a similar argument about automation," Woody asserts. "Instead of simply replicating the machine purchases that made the shop successful, the focus should be on finding ways to do more with less. This means continuous investment in technology and people. Wait too long, though, and you'll find your portfolio is worth much less than what it could have been had you stayed current."

Looking for increased flexibility and near-zero setup times? Consider DN Solutions' linear pallet system (LPS) with advanced cell control, shown here attached to an NHP 5000 Horizontal Machining Center. (Provided by Ellison Technologies)

Pinching Profits

Klaus Miller admits to being a penny pincher. It's an interesting stance for someone who makes a living selling machine tools. The vice president of sales for Absolute Machine Tools Inc., Lorain, Ohio, Miller doesn't like to spend money unnecessarily, but at the same time, makes a strong argument for selling equipment off before it becomes worthless.

"Once you've reached that point, it actually starts costing you money," Miller says. "You're paying for the increasing amount of downtime. You're paying for the replacement parts and someone to repair it. You're paying for the machine operator, electricity, fluids and, quite possibly, the scrap parts it makes. But most of all, you're paying for lost potential."

Miller doesn't necessarily agree with the seven-year mark cited earlier, although he does say that any machine 12 years or older is unlikely to bring much value for trade-in. And at the 20-year mark, shops are basically out of luck. "At that point, it will probably cost more to move and reinstall than what somebody's willing to pay for it."

A case in point is a shop that turned down a trade-in offer on a 15-year-old machine. A few years later, the shop had a crash that cost $40,000 to repair, significantly more than the machine was worth.

"That's one of the fallacies in this business," Miller says. "People figure the machine's paid for and no one will give them what they want for it anyway, so they might as well hang on to it. At the same time, your neighbor is outbidding you because his machines are twice as efficient.

"Like I said earlier, I'm a frugal person and my first instinct might be to run a machine into the ground, he continues. "But at the same time, you have to recognize that doing so could cost you a lot more later on."

Those costs include the concrete the machine sits on. Echoing Woody's comment about the cookie-cutter approach to purchasing equipment, Miller notes that a shop might have three older machines running production. But by investing in a completely different piece of technology—a smaller, more efficient boring mill or mill-turn machine, for example—it could easily

reclaim valuable floor space and fill it with additional, equally productive equipment.

"What does real estate cost today? It's only going up," Miller notes, "as are construction costs, which is why so many shops are buying space-saving, more capable machines."

Miller also seconded Woody's earlier statement—the most successful shops are the ones that continually invest in new technology. Those squeezing every nickel from a piece of equipment will not only be less competitive (and therefore unable to grow) but will also find it harder to attract the most valuable commodity of all: skilled workers.

"Generally speaking, machinists like to work on the latest and greatest equipment," Miller adds. "It's a lot more fun to work in a progressive shop; they get to learn new things, they're constantly challenged and they'll probably earn more money. That's a big selling point when searching for employees."

Big Decisions

John Crowe, president of Standard Machine LLC in Cleveland, has grappled with equally weighty considerations. Founded in 1969 by "one man and one machine," the company quickly gained a reputation among the area's steel mills and machinery builders for its ability to deliver large, high-quality machined components. That reputation still stands, and this 30,000-sq-ft (2,790-sq-m) job shop continues to service its original customer base, as well as those in the power generation, aerospace and medical industries, with parts the size of a pickup truck not unusual.

Crowe, who came on board as a production planner in 2008, soon discovered that several of Standard Machine's larger machine tools were well past their prime. "We had some really old stuff in here," he says. "But a few years after I accepted the role as company vice president, the original owner decided to sell the business. That was in 2021, and the firm that purchased us not only promoted me to president but began evaluating our equipment list and what we needed to stay competitive."

In at least one case, the evaluations were more a matter of how to stop the bleeding. After seemingly countless visits from a service technician born around the same time as the Ingersoll planer mill he'd been tasked with repairing, management finally decided it was ready for the chopping block.

Modernizing your CNC machine tools often brings unexpected costs such as training and tooling. (Provided by Ellison Technologies)

"It was quickly becoming useless to us," Crowe says. "First off, it was failing both mechanically and electronically—it seemed like every time we turned it on, we had to bring the guy out to fix it, and he was having a hard time finding parts.

"And even when it was operable, no one was comfortable running it, especially since many of our older employees have retired," Crowe continues. "Add it all up, and it quickly became apparent that we needed to swap it out for a new machine."

Better Iron

Crowe reached out to Jim Fink, self-described rust belt salesman for Absolute Machine Tools Inc. in Ohio, who'd been calling on the company for years. His persistence paid off. Standard Machine ordered a Johnford DMC-4100PH bridge mill with 4,100 mm of X-axis travel, an 8,000-rpm spindle, 40-tool ATC and

This Johnford DMC-4100PH is now running circles around Standard Machine's old Ingersoll. (Provided by Standard Machine Inc.)

FANUC 0i MF Plus control. Suddenly, Crowe had no problem getting people to run the machine.

"Our cycle times are much shorter, there's far less chance of scrap, and because the Johnford has a Renishaw probing system, setups are both faster and easier," Crowe explains. "And if we ever do have a problem, Absolute is only half an hour away. There's no longer a need to fly someone in from Chicago, or having to keep a repair person on a monthly retainer like we were doing with that old Ingersoll."

Fink is equally happy. "That DMC-4100PH actually replaced two machines—the Ingersoll and a 23-year-old Awea they were having trouble with. But they also had a big Toshiba they were always repairing, so they decided to swap it out for a Johnford BMC-110 table-type horizontal boring mill, and are about to replace a second Toshiba with a BMC-130. It's nice to see that it's starting to look like a big iron showroom for our company, but more importantly, it's nice to see a customer invest in new technology and become more competitive as a result."

Crowe has his own customer satisfaction stories to share. There's no more worry about a machine breaking down in the middle of a project, quite possibly delaying delivery or jeopardizing part quality. It's like having an insurance policy, he says, that allows the company to support its core customers more consistently.

"It sends them a strong message—we're here for you. They know we're investing in the equipment needed to produce parts for them without a hitch, no surprises. There's significant value in that."

One additional benefit might come as a surprise to some: Crowe finds it easier to attract talent, reinforcing what Miller stated earlier. "We installed all new LED lighting a few years ago, and since then, I've hired people who told me that was part of the reason for coming here," Crowe says.

"It's the same situation with machinery," he continues. "Would you rather take a job where much of the equipment is sitting idle or in disrepair, or with a shop that's clean, bright and investing in modern technology? I know where I'd want to work."