

Five Things to Consider Before Diving Into Automation

By Lincoln Brunner

When it comes to robotic automation systems, a forge shop that has yet to make its initial investment faces not one, but two, risks: Falling further behind its competitors and missing out on the double-digit efficiency gains that shops typically enjoy after taking the plunge.

However, putting hundreds of thousands of dollars on the line for technology that ushers in a whole new way of thinking makes quick ROI critical, especially for a small business. Fortunately, assessing the need for automation for mechanical or hydraulic forging presses is a lot easier than it might appear, according to Jim Morris, president of Automated Cells & Equipment, Painted Post, N.Y.

1) The 80/20 Rule

Morris hears it all the time: “I have a high-mix, low-volume menu of parts—automation just won’t work for me.” In response, Morris says that he asks hesitant customers to consider the following:

First, he encourages new customers to adopt the 80/20 rule by identifying the true outliers among its parts and immediately disqualify them from the automation conversation. Instead, they should group their parts into families that can be broadly organized by billet size and the stroke lengths of the grippers that handle them. Shops almost inevitably find that 80 percent (or more) of their parts can be grouped into a small number of part families that can be organized into predictable part runs much more easily.

That new mindset generally changes the conversation—as does the prospect of the 30-percent-plus gain in productivity that Morris fully expects customers to realize almost immediately after startup.

“I believe they will see an immediate productivity increase,” says Morris, whose

company specializes in FANUC robotic systems. “Their production planners will love it, because robots don’t get sick—they show up for work every day, as long as you’ve got power to the plant.”

2) Shift Work

A second point: Rather than look at the number of parts it produces, a business trying to determine its need for robotic automation should look instead at the number of shifts it runs, Morris says.

“When you do the 80/20 rule, if you can load up two shifts of work, you should be really getting after it,” Morris says. “If you’re running two shifts, automation will justify. If you’re running three shifts, why haven’t you already automated?”

Morris notes that many of his clients indeed run only one shift. “But they’re after the consistency and the quality, not so much the productivity increase,” he says.

3) Building a Starter System

Of course, achieving that kind of consistency and quality depends on a business investing in the right system for their operation:

Main robot. For a shop running a mechanical or hydraulic forge press, start with the “heater robot,” the unit that will pick up hot billets and load them into the forge. Of course, that robot has to accommodate the largest billets in the company’s parts lineup. That means buying a robot with an arm and end-of-arm gripper tooling that can hold the weight easily.

“If it’s a big forge, you need a bigger robot for the deeper reach into the press, and typically, it’s a higher payload requirement,” Morris notes. “So you need the appropriately sized robot and the appropriately sized end-of-arm tool. Grippers are designed

for a certain maximum payload. You can’t overload a gripper, or else you’re going to start dropping parts.”

Presentation equipment. The second-most important (and expensive) item after the robot is usually the part presentation equipment—often a conveyor designed for high-temperature applications. Systems with conveyors can get expensive; but even if there’s no conveyor, an automation system has to include some type of device that presents parts consistently to the robot. “The part presentation is usually customized for the installation,” Morris says.

Safety apparatus. Third, every system must include some safety equipment, usually featuring a safety fence with some interlocking doors to keep employees clear of moving parts.

Control system. Of course, every robotic setup has a control system that an operator can run with his gloves on, without having to fuss with a teach pendant if he doesn’t want to.

Takeaway mechanism. Some robotic systems also may include a takeaway conveyor. “If it’s a trim press operation, there might be a cooling conveyor or a takeaway conveyor,” Morris says. “Depending on what you’re doing, it could be as simple as putting the part in a chute and letting it slide into a bin.”

Machine interface. Last, but certainly not least, whatever robotic components make up the system, Morris emphasizes that the robot has to talk to the press in some way.

“We have to have an interface,” Morris says. “Is that 24-volt signals? Maybe the press has a PLC on it and you can talk to it through an ethernet IP communication. Newer presses almost always have some sort of a PLC. That makes it a lot easier for us. In older