

Advanced Automation Enhances Production Culture at Siemens



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Siemens Industry Automation Division, West Chicago, IL, is a leading manufacturer of motor control centers, enclosed controls, switch boards, and solar inverters. With two

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facilities spread over 210,000 square feet and 400 employees, the company recently decided to automate its sheet metal fabrication department.

“Prior to last year, our fabrication process was batch manufacturing,” explains John Hayden, manufacturing engineer. “We would cut blanks to length from coil, then walk them to a shear and cut to width, process the blanks in a stand alone turret punch press, followed by manual bending, welding, and painting operations. What drove our purchasing decision for a new automated line was the capability to manufacture just-in-time parts to meet our growing production demand.”

Siemens management did extensive research on the latest fabrication equipment prior to purchasing an automated system from Prima

Power (formerly Finn-Power). The equipment included:

- Shear Genius integrated punch/shear
- LPe laser punch
- EBe Express Bender
- Servo-electric press brake
- Night Train Material Management System that integrated the system

Prior to purchasing the new system, Siemens had an older Shear Genius with a storage tower and two older stand-alone turret punch presses.

According to Hayden, the linchpin for the final decision was his company’s previous experience with Finn-Power: “Prima Power has an integrated material handling system that other equipment manufacturers didn’t offer. With Prima Power we are able to utilize nesting and

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a Night Train material handling system that is integrated with the Shear Genius punch/shear, the LPe laser punch, and the EBe Express Bender. Driving the cost of production down was one of the key objectives, but being able to do our own analysis on what was our current performance and being able to justify new equipment was the key thing. The savings was there in order for us to justify the equipment.”

Shear Genius Flexibility

With the Shear Genius integrated punch/right angle shear combination concept, the objective is to provide one machine capable of transforming a full-sized sheet into punched parts. These parts can be moved to secondary operations utilizing the sorting and stacking automation and then on to bending operations without being touched by human hands. As loading, punching, and shearing of parts become automated, the result is finished parts with a dramatic reduction in scrap and manual labor while increasing profitability.

The Shear Genius eliminates wasteful skeletons and costly secondary operations such as deburring. Nibbled edges on the part exteriors are eliminated through the use of the integrated right angle shear. In fact, the same clamps that hold the sheet for punching also hold it for shearing. In essence, the Shear Genius allows the automated process to begin with a full-sized sheet of material and end with a punched part after automated loading, punching, forming, shearing, stacking and unloading – all in one operation. This allows true single-piece flow to be synchronized with a customer’s takt time.

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According to Deron Jackson, plant manager, 85-90% of the manufacturing Siemens does is custom engineered to customer specifications. “These parts have to run through our turret,” says Jackson. “We need the flexibility to be able to utilize a multitude of materials without setups. Having the Shear Genius integrated

into the entire material handling system was a huge upgrade. Today, the Shear Genius is the workhorse, fabricating 60% of the material we produce. The latest analysis shows a 20% scrap reduction compared to our old cut-to-length process.”

Night Train

The centerpiece of the Prima Power automated sheet processing system is the Night Train Material Management System, which is the inventory and material transporting center. The Night Train FMS provides a total solution for unmanned operation for sheet metal fabricators by automating system control, as well as material flow within the system.

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This includes supplying raw material, as well as, removing and storing work in process.

“The Night Train takes the raw material from loading to punching to bending to final processing,” explains Hayden. “We have output stations at each of the press brakes and bender. With the old process, the turret punch press operator would have to go and find the blanks he was going to use. Now it is presented automatically. With the Night Train, we have just one source for material. There is no backup or wait for material. It’s always available and there are no bottlenecks. We used to do a weekly cycle count to know how much material we had on all the various types and thicknesses and styles. Now this information is available online. We know exactly what material we have, how much we have, and where it is located. The operators are doing more operating and less material handling. In general, when we did all of our calculations, we were gaining a shift off the Shear Genius and Night Train. Sixty-six percent of these two pieces did what our old three machines did.”

LPe Laser Punch

The Prima Power LPe laser/punch combination represents proven technology and intelligent

integration of punching, forming, tapping, and laser cutting in a single unit for the most varied sheet metal operations. Optimum use of the Prima Power LPe means that a fabricator can use the turret punch press where it is easier or faster and the laser where it is the most effective. The LP allows the user to look at the parts to determine the optimum process for every production.

Major energy savings are achieved in punching by Prima Power’s Ecopunch® concept which uses braking energy in the acceleration of the next movement. The same applies to the 2,500 watt CO2 laser with no moving parts. Stand-by power consumption, gas consumption, and maintenance requirements are low. As a result, the LPe combines low operating and maintenance cost with superior versatility, precision, ergonomics and compatibility with modern ecological thinking.

“We purchased the LPe for the odd-sized parts,” says Hayden. “Our standard run-of-the-mill square type parts – doors, panels, etc. – are all right-angle type parts so they fit with the Shear Genius nicely. But a lot of thicker brackets and intricate smaller parts are ideal for the LPe. We’ve had excellent results with the

LPe, and the remaining 40% of our parts are run on this machine.”

“The servo-electric turret on the LPe is the wave of the future. The same is true in the bender and press brakes. The energy savings is there, the environment is cleaner, the accuracy is higher. It is the next step into the future.”

“This was our first laser, and I was really surprised how fast we brought this on line, and how quickly we were able to use the capabilities of the LPe,” says Jackson. “There is a learning curve for every piece of equipment, and it takes a little time to learn, but at the end of the day, it performs the way it is advertised and produces accurate parts with excellent edge quality. The servo-electric turret on the LPe is the wave of the future. The same is true in the bender and press brakes. The energy savings is there, the environment is cleaner, the accuracy is higher. It is the next step into the future.”

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EBe Express Bender

The EBe servo electric Express Bender is a bending solution that is designed specifically for each fabricator’s production requirements to achieve maximum productivity, quality, and repeatability. The bending operation is fully automated, from the loading of flat punched parts to unloading of the finished product.

The EBe bender has a maximum bending length of 100.39" (2550 mm) and a maximum opening height of 8" (200 mm). The new construction features actuations of the bending blade movements (vertical and horizontal) by NC servo axes instead of hydraulic cylinders. The upper tool movements are also made by another NC servo axis.



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Prima Power EBe provides the high bending quality required in demanding applications. The quality is achieved through precise control of bending axes, fast and smooth bending motion, open programmability, and rigid construction that is immune to variation in thermal conditions.

"The EBe Express Bender was new technology for us," explains Hayden. "When we saw it in operation the first time we said: 'We need this'. Setup times eat so much of our press brake capacity. It boggles my mind how quick setups are with the EBe."

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"We went from minutes on setups to seconds," adds Jackson. "And the EBe's accuracy really caught my eye. Our goal is to challenge our equipment. The EBe is taking everything we throw at it and still has capacity. The accuracy, speed, and quality of the machine is something that I've never seen or experienced in this industry. Engineers used to challenge production to make things. Now equipment like the EBe has the capability and functionality to challenge the engineers to come up with more complex solutions to assemble parts easier. As a result, we are redesigning many of our parts. We are using the design, functionality, and features of the EBe during the design process. It makes you step back and rethink the way you design. This piece of equipment is accurate within its tolerance ranges every time...all the time. The quality it presents is unmatched by human hands time and time again."

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Eliminating Outsourcing

"There has been a substantial labor savings with our new line," says Jackson. "We've been able to utilize the equipment to eliminate outsourcing. All of our sheet metal fabrication is now done in-house. Even the people on the floor know that our business is growing. They can see it...it is part of our culture. With the equipment that we had six months ago, we wouldn't be able to produce the output that we are doing today."

"I was impressed with how supportive the Prima Power management was during the installation and after. It was a very professional installation team. When we made a call when we needed help... we had support in a matter of hours...not days. We never heard the word 'No'...just 'what do you need'? This says a lot about the Prima Power people and their work ethic."

Prima Power Support & Service

"I was impressed with how supportive the Prima Power management was during the installation and after," says Jackson. "We were integrating the new system, and there was obviously a lot of pressure to have a seamless installation. In addition, our volume was increasing so we were able to implement this system into our every day production with very little interruption. It was a very professional installation team. When we made a call when we needed help...we had support in a matter of hours...not days. We never heard the word *No*...just *what do you need?* This says a lot about the Prima Power people and their work ethic. They have a good product and back it up with good people. As soon as the economy started going down, we executed plans for the new Prima Power automated line. We needed to put plans in place for future growth, rather than just staying flat with the economy. Prima Power was part of that vision."