

# The new way is advanced automation

*You don't stop the Night Train at Nu-Way*

By Jim Lorincz

Steve Southwell pretty much sums up the way many American manufacturers in the fabricating and metalforming industries regard the competition from low-cost manufacturing countries like China: "How are you going to compete with companies that have labor costs of pennies an hour, all the workers they need, and a government with a desire to put them all to work—even if it's just pushing buttons for elevators?" he asks.

Southwell, who is president and CEO of Nu-Way Industries Inc., Des Plaines, IL, quickly adds that the answer for U.S. manufacturers is found in adopting automation that leads to unmanned operation—as much as possible. "It's the only way to minimize the impact of the advantage in labor costs that these overseas manufacturers enjoy," he says. That's why Nu-Way invested more than \$6.5 million in an Advanced Automation Center, which includes a new building to house state-of-the-art sheet metal fabrication equipment from Finn-Power International Inc.

"We really had no choice but to make the investment," says Southwell, "if we wanted to continue to grow in serving a global market with engineered and manufactured products for our customers here and abroad." Currently, Nu-Way Industries supplies its precision metal products to customers in Brazil, Canada, England, Germany, India, Ireland, Japan, Mexico, The Netherlands, Poland, Spain, China, and Taiwan, in addition, of course, to the United States. China is the country that really started Nu-Way on its current path toward adopting the most advanced automated metalforming equipment.

The company, which was founded by George Howard and his brother Joe in 1968, over the years had



The Shear Brilliance FMC punch/shear machine combines processes into one lean manufacturing operation.



The Express Bender automates complex bending and the operations cycle from loading full size sheet to unloading bent parts.

grown from a small welding job shop to a vertically-integrated precision manufacturer of thousands of high quality precision metal parts, housings, and electronic enclosures.

Throughout its history, Nu-Way had been no stranger to adopting the latest manufacturing technologies and even had developed a few of its own. A

listing of the company's equipment and quality control capability fills seven panels of an 11"x16" page folded vertically. Its 400 employees work on a variety of machines, including turret punch presses, CNC press brakes, and laser cutting machines in operations controlled and managed by a sophisticated CIM/CAD/CAM network. The

## sheetmetal fabrication

company, for example, built its own robotic welders, has 12 high-precision Toyo Koki electric press brakes, and three conveyorized paint lines. Processes performed include shearing, perforating, forming, grinding, polishing and deburring, machining, welding, spotwelding, assembly, and finishing.

Nu-Way's CIM/CAD/CAM is networked on five servers with ERP software providing visibility for all phases of



Parts begin as full size sheet, delivered to the Express Bender, after processing on the Shear Brilliance.

**Nu-Way's Robotic Press Brake is a 138-ton unit with a 10-foot bed tended by a free-standing UP165 Motoman robot.**



manufacturing from quotations through scheduling to accounting. Quality control is maintained through calibration of all gages to NIST standards and certification to ISO and Mil Spec standards. Southwell points with considerable pride to Nu-Way's "job shop within a job shop," a fully equipped tooling area set aside to handle special orders, rush orders, and prototype work without interfering with the company's production flow.

### A showcase of productivity

That's a pretty good snapshot of Nu-Way's capability before it began investing in its Advanced Automation Center (AAC). In early 2001, the company was acquired by Steve Southwell, a long-time employee, and Mary Howard, an attorney and the second oldest daughter of George Howard. "We had worked together for a long time and weren't ready to let go of a company that we had worked hard to establish in our industry," says Southwell.

"The investment seemed like a good idea when the metalforming industry was going great guns before the telecommunications bubble burst in late 1999," says Southwell. What happened



Laser Brilliance combines a 3.5kW laser with Finn-Power's hydraulic 30-ton station, 30-ton turret punch press and linear drive technology for extremely fast and accurate positioning.

next was the influx of competition from China and pressure from at least one of Nu-Way's multinational customers to match the price of product from China or to source it from China.

"We had no choice but to adopt the latest in automated sheet metal processing to remain competitive," says Southwell. To house the Center, Nu-Way built an adjoining 62,000-square-foot building on its 13-acre site, bringing the Nu-Way's total manufacturing and office space under roof to 300,000 square feet. The Cen-

ter has become a showcase stop for Finn-Power's sheet metal fabrication equipment.

The capability of the Center is ideally suited for the products and the volumes that Nu-Way produces. They include chassis and enclosures for the telecommunications, gaming, and security and protection industries, among others. The range of materials processed includes stainless steel, aluminum, and cold rolled steel in thicknesses from 0.028" to 1/8".

The centerpiece of the automated sheet processing system is Finn-Power's Night Train Flexible Manufacturing System (material management system), which is the inventorying and material transporting center for four machines: the Laser Brilliance, Shear Brilliance, EB Express Bender, and the Robotic Press Brake. 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. This includes supplying raw material as well as removing and storing finished product. With the Finn-Power FMS, Nu-Way can begin with a full-sized sheet, load, punch, form, unload, stack, robotically transfer the part to the automated bender, bend, and unload the finished part without a human touching it during production.

### Punch/shear/bend

The Shear Brilliance Flexible Manufacturing Cell punch/shear combination features linear drive technology, an unloader stacking system with buffer storage, and unloading robot. It combines the operation of a 33-ton punch with 60"x40" right angle shear. It is capable of processing a 60"x120" or 60"x165" sheet without repositioning. The Shear Brilliance consolidates manufacturing processes into one operation and, in effect, becomes the service center for other cell activities. Material is delivered to the Shear Brilliance for punching and shearing, then passes through the various sorting systems for small parts, while the large sheet goes into the stacking buffer robot (with a turn-over capability to handle any special job application such as louvering) and then loads into the Express Bender to execute the bending process in a vir-

tually unmanned environment.

The Express Bender with stacking robot is capable of bending 0.125" cold rolled steel in 10-foot lengths and 10" deep. It automates complex bending with accuracy and has last bend negative capability. It can fully automate the operations cycle from loading the sheet to unloading the bent parts.

The Express Bender works the edges of the panel, which is especially well-suited for the panels that Nu-Way manufactures. Generally, the process starts at the external edge of the sheet and continues to the inner part of the sheet, working one side after another in sequence until all bends are completed. The sheet is loaded onto the working table and the manipulator pushes it against the positioning pins. The manipulator holds the workpiece firmly during all of the manipulation phases, including forward/backward movement and rotation.

The Robotic Press Brake is designed to provide unmanned bending at maximum speed, quicker setups, and changover times, and produce exceptionally consistent parts. Nu-Way has a Model B125-3060, which is a 138-ton unit with 10-foot bed. The robot is a UP165 Motoman robot. By combining the press brake with a robot, Nu-Way is able to form large or small parts with a variety of profiles. Accurate positioning for bending is achieved using high quality sensors for both back gage fingers. Because the robot is independent from the press brake (not mounted on the press brake's frame), it has a weight

capacity of 143 lb. A 7<sup>th</sup> servo axis increases versatility for bending and material handling operations.

### Add laser punch combo

The most recent addition to Nu-Way's Advanced Automation Center is the Laser Brilliance, which combines a 2.5kW laser with Finn-Power's hydraulic 30-station, 30-ton turret punch. The Laser Brilliance utilizes linear drive technology for very fast, extremely accurate positioning throughout the full 3,000 mm (X axis) working area. It can reach axis positioning speeds up to 228 m/min, as well as laser cutting speed of 20 m/min. The combined performance of Finn-Power's hydraulic system and the fast linear drive system allow up to 1,100 h/min nibbling speed and 550 h/min punching speed at 25 mm distance.

As you might guess, programming of the automated Night Train system is critical. "Finn-Power supplied all the programming and training both at its facility and at ours," says Southwell. That included training in programming, troubleshooting, testing, and proving the system out. "Troubleshooting the machine for programming issues involves knowledge of applications...and that's all about experience," he adds, noting that "planning and scheduling



**The Night Train doesn't stop and now stretches almost the entire length of the Advanced Automation Center to inventory and deliver sheetmetal material to the four Finn-Power machines.**

the machine are critical. Setup is not a big deal. You can teach operators the idiosyncrasies of the Finn-Power machines as well as any others."

The ultimate measuring stick for the Nu-Way's automated system is its ability to fill its capacity. "It's designed to run 24/7," says Southwell. "We still have a way to go, but we've gained the competitive edge that we were after," he says. "Without it, we couldn't begin to compete."

Southwell knows whereof he speaks. He had gone to China in search of a partner to meet a cost target set by one of his multinational customers, but he gave up the search when he couldn't find a satisfactory one with the quality of product we are able to produce in the U.S.

"What I have to do is make sure that my price is competitive," he concludes.

**Finn-Power International**