

PC based SPC provides foundation for quality

By Kevin Urban, Midwest Metal Products and Karin Groening, Zontec

Midwest Metal Products of Cedar Rapids, IA, uses SPC on every job regardless of the quantity. On their turret press and forming processes, SPC has helped cut reworks to 0.6% and has reduced production costs. It also has gotten workers more involved and has shown customers that Midwest Metal Products is serious about quality.

Midwest Metal Products makes precision fabricated parts, such as electronic enclosures. Their processes include metal forming, welding, painting, stamping, polishing, and screen printing. While they produce parts for a wide range of industries, such as pharmaceuticals and agricultural equipment, their main focus is on parts for aviation and electronics. A number of their processes have military certification.

When the company began its SPC program, they selected data collection equipment with portable printers but without CRT monitors. Under this system, operators gathered data from four CNC turret punch press stations and two forming operations. Operators uploaded data to the black box data collectors and downloaded it to PCs for analysis. It took an average of 15 - 30 minutes to gather and download data for each job. For their second generation with this type of equipment, CRTs were added, but the system was still not PC based and data still had to be uploaded to a PC.

For their third generation, they decided a PC based network would fit their needs better. After a thorough search, they selected Zontec's SPC TimeSaver Network Management System II

because it offered user friendly features, flexibility, on going support and development, and was easy to learn. This system allowed them to expand SPC to all operations, including office administration, and to cut data collection time to 2 - 3 minutes. In use for six years, this system encompasses 25 PCs and involves all 110 of the company's employees.

Before starting a job, operators measure the thickness of every other piece of sheet metal. The data, which is categorized by supplier, flows directly into SPC TimeSaver control charts. This lets operators see the average thickness for the sheet metal so machines can be adjusted accordingly in the forming stage of production. Separating data by supplier shows which suppliers offer the most consistent product.

In the CNC Turret Punch Press and laser cutting operations, operators measure every blank that's punched or laser cut to determine if they are within part tolerance. Measurements are instantly displayed in SPC TimeSaver control charts at the operator's workstation, so they can find and react to any problems when they occur. All Midwest Metal Products operators go through formal SPC training shortly after they are hired and are fully qualified to interpret control charts and adjust their processes as needed.

The SPC TimeSaver Network Management System II lets users link data files together so that an operator can enter data into sequential files quickly and easily. Data enters one data file through a MUX 10, and the system automatically advances to the next file in the sequence. This allows the operator to progress through readings without manually switching the active file.

After the metal has been punched and laser cut, it goes to the forming process, where it is shaped to meet the job specifications. Here operators check key forming dimensions, entering their data into SPC TimeSaver as they go.

From forming, the parts go to the welding process, where operators gather both variables and attributes data. For each type of welding, including fusion, stud, spot and robotic, operators measure key dimensions. They collect attributes data on weld penetration, pull-test readings, and the number of welds. As with variables data, this data appears immediately in SPC TimeSaver's charts.

In the next stage of production, hardware installation, operators collect attributes data on the number of fasteners attached to the part. They also record if the right fasteners were used, if they have been installed properly, and the number of defective parts.

Attributes data is also collected in the final production processes, painting and screen printing. In the paint department, operators check the color and thickness of the paint as well as the amount of dust and dirt particles and texture. They also check for proper coverage, paint runs, and to see if part features are masked off properly. Operators in the screen printing department use SPC TimeSaver to record part orientation and the edge and line quality of the printing.

Although each part is checked at every stage of the production process, packaging personnel do a final inspection for cosmetics. SPC TimeSaver Network Management System II graphically displays the part, showing the exact features that need to be checked. Because this is a network, inspectors can pull up the entire history of a part within seconds, regardless of which

department generated it. While reports and charts can be provided if customers request, for internal purposes the system is paperless.

Midwest Metal Products also uses SPC TimeSaver in the office. In this area, the main function is Pareto analysis for tackling problems. This application has helped shorten front end time for jobs. By identifying the causes of the delays, they were able to refine the process and cut the number of people handling a job up front from five to two. This gets the job on the floor faster and shortens turnaround time.

SPC provides the base for the entire quality program at Midwest Metal Products. It encourages everyone to constantly improve their processes and products. Since implementing the new system, they have reduced inspection time, reworks and frustration. With few reworks, operators can be more productive and profits have increased. Production employees feel much more involved in the process and they've seen an increase in customer satisfaction and confidence.