

# Who uses Synergy 2000?



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Synergy 2000 users represent some of the most successful businesses anywhere in the world. They've experienced immediate and dramatic process improvements because they're squeezing out every trace of variation on the road to continuous improvement. That translates into hundreds of thousands (often millions) of dollars in savings each year. And for companies pursuing Six Sigma initiatives, Synergy 2000 delivers the perfect complement of quality management tools for achieving zero defects and the ultimate in customer satisfaction.

Consultant encourages commonsense SPC

Tooling specialist has Synergy 2000 network up and running within a day

Plastics molder consolidates production & inspection to save

\$100,000/yr

Automotive supplier reduces scrap by 80%

Container company compresses reporting time from 4 hrs. to

minutes

Defense contractor chooses real time over 2-day process feedback

Connector manufacturer gets extra \$200,000 order when customer observes

Synergy 2000 in action

Diaper maker impressed with Synergy 2000 ease of use and opportunities

outside the production area.

Defense user named 'Best Plant' finalist by Industry Week Magazine.





### **PepsiAmericas Reduces Production Waste by \$2-million per Year**

The next time you take a sip of a Pepsi® product, take extra enjoyment in knowing that a sophisticated lab testing and quality control system called PASLAB is in place at PepsiAmericas.

Easily Zontec's most elaborate custom-designed software project, PASLAB acquires and manages test data from PepsiAmericas' lab measurement equipment to satisfy their parent company's strict product testing standards, master specifications, clinistics and regulatory requirements. It features a quality control component centered around Synergy 2000™ Statistical Process Control (SPC) software, and is currently being used in 21 plants in the U.S. and the Caribbean.

PASLAB replaces an outdated quality tracking system that lacked the ability to be networked and had ceased to provide PepsiAmericas with a real enterprise-wide solution. As a result, various plants had their own sets of specifications that oftentimes didn't match that of their PepsiCo parent. "PASLAB ensures that all facilities are playing on the same field, working from one set of master tables," says Al Warner, Director of Quality.



The application front-end was built using Zontec's S2K DLL and ActiveX toolkits which allowed the system to be flexible, provide an open architecture for the future, and interface with various data collection devices using standard off-the-shelf hardware.

The system captures data such as CO<sub>2</sub>, Brix, TA/pH, net content, and TDS/TBD and transfers it to PepsiAmericas Headquarters in Rolling Meadows, IL. "It allows us to prove to PepsiCo that we performed a test, what time we performed it and what were the results. We incorporated closed-loop logic so that Lab Technicians can't proceed until the test requirement is completed," notes Warner. Thus, full product traceability can be achieved. "Now we have a system that presents the data in a format that the beverage industry is familiar with, and can output reports any way we wish."

"In the first year, we've reduced our out-of-standards by 50%, improved our compliance level from 96.3 to 98.5, and reduced waste by more than \$2-million a year," he points out.

The Quality Control portion of the system gives PepsiAmericas the monitoring, analysis and charting capabilities for driving the business forward from a continuous improvement standpoint.

Each month, the individual plants have been submitting a performance report card for the

system. Zontec consistently rates scores in the high 90s (out of a possible 100) based on accuracy and functionality of the data flow, report capability, project progress, hardware interfacing and phone support.

“Pepsi plant have long spent too much time collecting data and not nearly enough time interpreting and taking the correct action. PASLAB enables plants to work smarter,” says Tom Tansey, Technical Services Manager at PepsiCo.

During 2004, PepsiAmericas expects to expand PASLAB into their facilities in Poland, Hungary, the Czech Republic and Slovakia. In total, the capability will allow the company to satisfy the product preferences for more than 117-million consumers.



### **Shaw Extrusions Puts an Enterprise-wide Spin on Quality**

Shaw Extrusions has pressed a new tool into service within its Six Sigma initiative that completely transforms the organization's mindset regarding quality. Traditionally, monitoring and controlling processes were viewed as lab functions. Today, process data is so tightly woven into its Windows NT network that quality becomes a collaborative effort, and accountability can even be shared by employees on remote fringes of the business. Shaw Extrusions, a division of Shaw Industries Group, Inc., supplies carpet fiber to the company's carpet and rug manufacturing operations throughout the U.S. and Mexico. Its parent, Shaw Industries Group, is the world's largest carpet manufacturer and a Fortune 500 company. Being a total floor covering company, their diversified product line includes laminate flooring, ceramics, hardwood and linoleum. The extrusion business unit handles nylon polymerization and production of bulk continuous filament, twisting and heat-set operations and color compounding.

“We had the training and the methodology to support a quality philosophy such as this for several years, but it was not until we implemented Zontec's Synergy 2000™ statistical process control (SPC) software that we could make process data accessible in real time to the whole organization,” says Herb Upton, Corporate Quality Manager. “Two years ago, if we were to do the amount of SPC analysis we're doing now, we would have had to hire more clerks, staff, etc.”

Previously whenever a customer—one of the Shaw Industries sister divisions—requested production information, Shaw Extrusion staff members would manually retrieve handwritten test results or SPC charts prepared with pencil and paper. Those results would be photocopied and then faxed to the customer. “That took time and money. Now we're able to access that data off the server at any location at any one of our plants,” Upton explains. We're able to put the data into many forms such as SPC control charts, histograms, capability studies, Pareto charts and more. Then we simply e-mail the information to the customer, and they have it immediately. It's a much more

sophisticated way of presenting the data, but more importantly, it's built instant credibility with them.”

The Synergy 2000 design encourages a team approach to quality. The system consists of three modules that perform complementary roles among process participants: the Engineer Level is the administrative element of the system where quality or process engineers create product or process files, establish sample sizes, control limits and analyze the data in order to build a strategy around the elimination of variation; the Operator Level is the plant-floor component where data entry takes place; the Manager Level is the enterprise-wide monitoring and reporting aspect of the program where a “command central” type of visual display shows managers the precise status of every process occurring on the network.

Similarly, Upton's team has also customized a dashboard screen for Shaw's Process Engineers. “When the program is started up each morning, the dashboard automatically appears telling them what processes they need to work on first.”

The system is so practical, individual data points are color-coded to show control or specification conditions as the data is entered. Operators react to these conditions by adjusting the process or taking some corrective action. Users respond to traffic-signal-inspired alarms: green for a smooth running process, yellow for the development of undesirable process trends, and red for problems that are statistically significant and demand immediate attention.

To guarantee success with the system, Shaw invested significant resources in educating its workforce on basic SPC principles and best practices. “Around that, we built a set of troubleshooting guides for Operators to help them interpret out of control conditions, for example, what is an eight-point run, what is a trend or what is the meaning of ‘out of bounds,’” he explains. “Whenever they see a red data point, that is their signal to refer to the troubleshooting list and try to associate it with a root cause or a change in the process.” Overall, process variability has been reduced by 10 percent.

Typical characteristics that are tested using SPC are denier (actual weight of the yarn), percent tenacity, percent elongation, mod ratio of the individual filaments, and finish on yarn, among others. “These are all measures we grade against specification as to whether the product passes or fails. With this system, we're able to pick up non-conformities on the spot, take those off-line and fix the problems before a defective product ever gets shipped to the customer,” Upton points out.

By monitoring production in real time, Shaw has been able to greatly reduce overhead, not just from a personnel perspective, but from manufacturing cost savings. For instance, if denier weights are too low, then the manufacturing plant will reject the shipment to avoid producing substandard carpet. If denier is too high, then more expensive fiber is used than necessary. Likewise, if too much lubricant is applied for the finish on yarn process, then raw materials are being wasted.

Shaw is also using Synergy 2000 as a key driver to prove machine capability so that product containing the same yarn systems can be merged onto fewer machines. A series of machines is currently used to produce the same product, but each machine carries a separate lot number. In turn, each lot number goes into separate carpet orders. Shaw identifies key measures to narrow the variation so that lots can be merged together. That

results in dollar savings, reduction of waste and inventory.

Upton describes the control chart function within the software as “the bread and butter of the system.” “But our engineers are continuously finding new uses for SPC reports.” The Certificate of Analysis, a standard report feature in Synergy 2000, is designed as a preformatted document that travels with the customers’ shipping documents and certifies that the required quality analyses were performed on the product. The Zontec quality management technology was discovered by Shaw’s Corporate Quality Engineering Group. During their comprehensive software evaluation that included numerous standalone systems, network-based SPC quickly became a leading requirement. Synergy 2000 was piloted in Shaw Extrusion’s Thompson, GA, facility where it excelled for their plantwide process monitoring needs. Its application throughout the entire business unit was immediately apparent. “We were up and running in only a week or two,” Upton recalls.

Since that time LAN lines have been upgraded to support true enterprise sharing of information. If all goes according to plan, by the end of 2002, Engineers from one Shaw location will be able to access the data at any other Shaw Extrusion location throughout the southeastern U.S. Users won’t have to request process information via e-mail any longer; they’ll be able to help themselves to it, looking at any Shaw process running on any one machine within any one plant.

“Synergy 2000 has been a shining star in our organization,” concludes Upton. “It’s been an integral tool for Six Sigma, and it’s our single archive for quality data. Getting rid of filing cabinets and keeping data on a network server is the smarter way to work. We’ve become more efficient and reduced our costs along the way. It’s let us get back to concentrating on the process and to see how good our products can be by squeezing out more and more variation.”



### **Dayton Reliable Meets Demands of High-Volume Production with SPC**

Top-line Benefits Summary:

- Real-time production-based decision-making
- Elimination of manual calculations and redundant data handling
- Paperless storage of quality data
- Manufacturing cost reductions
- Timely access to data for continual improvement projects

The expansion into new markets has led a Dayton, OH, precision manufacturer into

unprecedented level of efficiency and quality through automated statistical process control (SPC).

For more than 50 years, Dayton Reliable Tool & Mfg. Co. has channeled its design/build expertise into traditional small-volume applications as an OEM equipment supplier into the easy-open can end industry. Most recently, however, the opportunity to engage in increased volume production has come from outside its established product line and customer base. Power generation and medical industries comprise Dayton Reliable's newest markets, manufacturing more complex parts that require critical measurement capabilities at the point of production.

"The parts we manufacture have become increasingly complex, often involving multiple radii and angles to be measured," says George Kloos, Director of Quality. "Using the latest inspection technology, we've defined a point in space where we expect the part to be, and we then measure the deviation from that point on the machine tool using a Renishaw touch probe."

With more than 200 machine tools at their disposal including EDM and CMMs, Dayton Reliable determined that manual data capture from measurement equipment was highly inefficient—preventing operators from identifying and resolving production problems quickly. The company empowered its operators with the responsibility for making split-second decisions concerning a part run and carrying out the appropriate response whenever process variation becomes excessive.

A real-time SPC software program was the key technology that enabled Dayton Reliable to achieve its goal. Three software vendors were evaluated. One was deemed unsuitable for the shop floor because it did not visually convey process conditions adequately to operators. A second package was eliminated for its lack of real-time functionality. The system that best met Dayton Reliable's criteria was Synergy 2000™ from Zontec.

Prior to installing Synergy 2000, SPC was performed with a calculator based on pencil and paper records or from printouts obtained from the measuring equipment. That procedure was time-consuming and error-prone. Today, operators watch color-coded status flags over the Windows® NT network that tell them if the parts they are machining are within engineering tolerance and if the process is in control. Gages, CMMs, and other measurement tools feed the data into Synergy 2000 automatically. Operators are free of any manual data entry.

The software utilizes a traffic-light analogy to indicate the type of action required from operators: green for a smooth-running process, yellow for the development of undesirable trends, and red for serious process problems. Operators react by making equipment adjustments or taking other corrective actions on the spot.

In addition to the simplicity of the color-keyed process indicators, Dayton Reliable can focus on any one measurement characteristic if they desire. Operators can view control charts or entire spreadsheets with a single click of the mouse. And Kloos can customize the appearance of the program window for operators based on the requirements of each individual part or job.

"We see a huge potential cost avoidance taking place," notes Kloos. "The savings comes from knowing that a problem exists now instead of later. When you produce a defective



part, most companies recognize the waste in material and labor. What people forget about is the amount of time that was consumed producing a bad part. In effect, you reduce your capacity to produce good parts that you can sell. It becomes a matter of lost revenue," he adds.

The mere fact that Dayton Reliable has moved to a paperless environment is also contributing to their cost savings. "We're saving time because we don't have to write things down, says Kloos. And the software helps us improve our accuracy by recording the correct value, and not a transposed number or a slipped decimal point. We're using our time better because we don't have to perform calculations; it occurs simultaneously with the data entry. Later, if we need to evaluate the data, we don't have to locate the original piece of paper the data was recorded on."

"The sheer volume of our production data was extreme," he recalls. In most cases, printed production reports were several inches thick. "The other problem was that it was not stored in any electronically retrievable manner. If you were looking for a trend, needed to analyze a problem or do tracking, you had to re-key all of that data into an application like Excel and then proceed with the analysis. Now it's in the file and the manufacturing engineer or machining supervisor can refer to it any time." This is especially important during the measurement and analytical phases of continual improvement projects.

According to Kloos, the Synergy 2000 implementation occurred rapidly. "From the time we had the software installed and the hardware configured, it was a matter of about a day. Then we spent a couple of hours with the operators to explain to them what data they were looking at, when to become concerned and how to respond."

Users were generally receptive to the new system, but represented two points of view. "Operators who were having to manually record numbers and use a calculator were very pleased that they only had to press a button and instantly see the result of the measurement," he points out. "The operators using a CMM were a little more reluctant to rely on a status indicator than an actual number. Our employees are very number-oriented people. They're very precise machinists who take great comfort in their numbers. For them, it was a different mindset, but they soon realized it was a change for them and the company."

Because most of the company's bread-and-butter business doesn't have enough volume to support real-time SPC, Kloos applying valid control data across a commonality of lower-volume parts. "One interesting application looks at variance from nominal as the measurement parameter across like parts and machine tools. Short-run SPC provides additional process information that we didn't have before we implemented Synergy 2000. We can compare like features of different part numbers from multiple vertical machining centers and wire EDM machines. Now we can look at the effect of the machining center on the wire machine as well as the part itself." For example, the location of the pickup holes at wire is critical to the overall stability of the part's length. Therefore, hole location is a critical SPC parameter that is monitored at the machining center.

In less than nine months, Dayton Reliable has truly demonstrated its commitment to continuous improvement. Whether it's the more pro-active approach to process variation,



the elimination of redundant data handling or cost avoidance, the company is convinced that real-time SPC is helping them grow their business.



### **SPC Software Changes Company's Culture, Trims Inspection Costs, Improves Turnover**

Six years ago, World Class Plastics, Inc. (WCPI) launched itself into the business world supplying a single product to a single customer.

Today, the privately-held company ships 10-million components per month from a product line that spans 500 separate parts. Along the way, their growth rate has skyrocketed as high as 46% a year.

How did success come so quickly in spite of the enormous odds stacked against many startup companies? "We think it comes from paying attention to quality and delivering high levels of customer service," says Ron Buchenroth, VP of Marketing at WCPI. "Quality starts with a firm commitment by our leadership to put systems in place that prevent nonconforming products and encourage our associates to produce to our customer's specifications."

The Russells Point, OH, specialist in thermoplastic injection molding provides parts to automotive, appliance, electrical and medical/dental industries. "Our forte is very small close-tolerance and visually critical products," notes Buchenroth. These include clips, fasteners, gears, cams, bearings, levers, vents, louvers, meter cases and coverings.

Supplier ratings from all their customers are excellent. Their six-year delivery rating is near-perfect—a remarkable achievement especially when lead times can be as short as 24 hours.

#### **Technology that Supports Quality**

WCPI has invested heavily in technology to ensure the highest quality parts. The company operates Sumitomo horizontal presses ranging in size from 18 to 350 tons that all have Yushin automated sprue pickers and several Yushin multi axis robotics as well as Kawaguchi and Shinwa degating robots. There are Mitutoyo calipers at each work cell, and additional calipers and an OGP Avant 600 video measuring machine in the Quality Lab.

"Our receiving, startup in-process, final inspection and SPC part discrimination chutes are designed to prevent defects and allow the molding technicians a method to arrive at the root cause of a problem and prevent it from recurring," explains Director of Operations Brett Johnson.

For its initial computerized SPC implementation, WCPI used an Excel worksheet-style SPC program that they had developed using Visual Basic. The concept of an interactive worksheet that could be customized for each job and would trigger out-of-spec alarms was sound, but cumbersome. WCPI soon found they had an extremely large data base that hampered system performance. Another drawback, says Johnson, was the inability to open the Excel file and have associates work on it simultaneously from more than one location.

## **Integrating Quality and Production**

The quality technicians who conducted inspections were also being spread thinly over output from machines. "It was our goal to move to cellular manufacturing where each work cell takes responsibility for both their production and quality goals," he says. The decision to implement Synergy 2000, a 32-bit SPC software package from Zontec of Cincinnati, OH, held tremendous promise as an enabler of what WCPI wished to achieve.

Synergy 2000 is an enterprise-wide quality management tool designed to stand up to mission-critical production environments. The system is actually three software programs that work together in complementary roles. The Operator Level is used by production staff for real-time data collection and input. The Engineer Level is used by Quality Managers or Engineers who configure the SPC files, establish control and specification limits and analyze data. The Manager Level is used by executive personnel who wish to monitor all the processes in real time from a single screen and create summary and customized process reports.

"One of the features that immediately appealed to us about Synergy 2000 was the ease of data entry," recalls Johnson. "The software is so visually oriented—it makes for an extremely user friendly system. For example, it notifies you in real time with color-coded status flags in green, yellow or red depending on whether the process is in or out of tolerance. Similarly, we get a second set of status flags in green, yellow or red for process control conditions."

"The management software lets us view everything that's running on the shop floor in all the cells simultaneously, and if a process goes out of control, the system automatically E-mails you of that situation. We can also send messages to and from workstations right within the software. But what we really liked was having concurrent data input at all workstations. It's an approach we envisioned all along," he continues.

## **Outstanding Traceability**

Not only does Synergy 2000 deliver the capability study on the tool and the part as well as the Gage R&R study on the gage and the part that WCPI's customers require, the software provides extensive traceability features. For example Johnson says, "we use the SPC software to monitor the material lot number and material certification. We track which press the part is running on to give us capability studies to tell us if we have press issues. Some of our parts are run on multiple machines, so we can find out which of our machines runs it best. We also need to know for QS-9000 requirements which gage measured the part and which of our associates measured it. The system keeps track of our Gage R&R data, and even alerts you automatically when the next study is due."

To prepare for the launch of Synergy 2000 into the WCPI environment, the company developed an implementation plan that would establish user confidence and ensure a fast start with the software. Johnson first attended an eight-hour "train the trainer" workshop at Zontec's education center, and returned to WCPI to share his knowledge with representatives from all three shifts. "We thought it was important to make sure that every shift had access to someone who was well trained and well versed in the software," Johnson points out. "Then we scheduled associate training in four-hour increments over a weekend. On Monday, we actually went into production with Synergy 2000. It was seamless."

Presently WCPI is focused on document data control which will help satisfy their QS-9000 requirements. Placing current documents on the network and opening them within the Synergy 2000 program prevents obsolete copies from being used. "We can also open pictures and prints, and customize the screen so that when associates open a job, it will automatically bring up the print and any kind of work instructions related to the part," he adds.

## **A Culture Change with Unexpected Results**

The impact of the new system “has greatly changed our culture,” says Johnson. “Obviously we’ve become more proactive with respect to quality. Looking in more quantifiable terms,

we’ve been able to streamline the inspection process and redeploy seven quality technicians. Now the production technician has responsibility for making the part and its quality. On just the inspection side, we estimated cost savings of approximately \$100,000 a year.”

There have even been some positive but unanticipated benefits to the new approach to product quality. “It’s drastically reduced turnover,” notes Johnson. “Associates actually feel like more of the team. They no longer sit unchallenged in front of a press day after day. They have a higher sense of responsibility and genuine ownership of what happens in their cells. They have higher self-esteem, and want to stay on as long-term employees.”

The software has become so valuable to WCPI, the company has decided to provide the Synergy 2000 Manager Level to selected customers, so they can examine their data and generate reports themselves. “This activity will reduce our report time by as much as eight to 10 hours a week. It’s a good example of how we are looking for ways to continuously improve, increase efficiency, and add a higher level of value to our service. Synergy 2000 definitely helps us achieve that higher level of value,” concludes Buchenroth.

## **Halla's Canadian Unit Cools Its Scrap Rate**

How is it possible to take an 80% bite out of your scrap and start turning out parts with very little variation—all within a three-month period? For Halla Climate Control Canada Inc., it took a management commitment to quality and the technology to support it. In Halla's case, the technology was automated statistical process control (SPC).

Halla, a joint venture of Halla Korea and Visteon Corporation, manufactures climate control products for the automotive market. The company is a leader in the production of underbody refrigerant and coolant lines, accumulators/receiver driers, blower units, and clutch components that are used on clutch-cycling air conditioning (A/C) compressors. In a vehicle's A/C system, refrigerant is carried through the refrigerant lines in both liquid and gaseous states. The refrigerant lines incorporate valves for charging the system, pressure switches to regulate the operation of the compressor and a flow restrictor that transforms the high-pressure liquid into low-pressure gas. The coolant lines circulate hot engine coolant between.

## **Zontec Reseller Delighted with First Synergy 2000 Installation**

In less than six weeks, Zontec reseller, R.G. Weber Control Systems, led a Texas-based military defense contractor through the SPC software evaluation process involving six vendors and now has the facility up and running with Synergy 2000.

The contractor was previously collecting process control data on line, but not performing SPC on the machined parts. “It became clear that they needed to start quantifying the

parts on the floor and improving their reporting requirements to the government,” says Bob Weber, President of the industrial automation system integration company. The scope of the project requires real-time status alarms and messaging, assignable cause documentation, operator entry via keypad and digital gages and will eventually encompass 48 workstations.

“Before, their SPC efforts involved a two-day turnaround,” notes Weber. “The operator wrote numbers on a sheet and sent it up to the SPC engineer who entered it manually into an SPC program and plotted the charts. If they were making bad parts, they didn’t find out about it until two days later.” Without physically being on-site, Weber is serving as project pointman while the contractor finalizes supervisory assignments. In his St. Louis office 850 miles away, Weber uses his internet browser to connect to a Citrix® server on the contractor’s Windows® NT network. There, he monitors production activity as it actually takes place. “I can look at the exact same conditions their operators are seeing,” he says. “When a process alarm turns red, the operators and I can investigate the condition simultaneously, and I can step them through the adjustments they need to make.”

“The installation was straightforward. We got it on the server immediately and sat right down at one of the PCs and started configuring the data files. I’ve only been working with the basic software functions for two to four weeks, but I have a feeling the software is far more powerful than we imagined. There are many capabilities we want to take advantage of, but we already consider the project a success. Because right now operators on the production floor can see the machines that are in, the machines that are out, and they have real-time feedback that they didn’t have six weeks ago,” concludes Weber.



### **SPC Software Increases Sales, Slashes Defects**

*By Mike Hodak Quality Assurance Manager*

*WECO Electrical Connectors Inc.*

Electronic and electrical connector manufactures and contract manufactures must use exacting materials and assembly methods in order to prevent defects and their subsequent hazards to property and people. Meeting UL, CSA, VDE and other agency regulations is essential. Increasingly, manufactures are implementing software-driven statistical process control (SPC) techniques. As a result, millions of dollars that would be otherwise be wasted as scrap, rework and customer returns are being saved.

At a Canadian electrical and electronic terminal block and connector manufacturing facility, a sales increase of \$200,000 on a \$1,000,000 account took place as a result of the facility’s improved SPC methods. Having tolerated laborious computations by hand for

years, this multinational company now uses SPC software to serve its needs. Bottom-line cost improvements are mirroring the use of the SPC software, and the software's return on investment was swift -- just four months.

### **About the Company**

WECO Electrical Connectors Inc. produces terminal blocks and connectors for printed circuit, panel/chassis and rail-mounted applications. Although the United States is its biggest market, the company has a world-wide customer base with manufacturing facilities in Germany, Canada, Switzerland and Tunisia. Its terminal blocks and connectors are supplied to industries such as heating ventilation and air conditioning (HVAC), industrial controls, and instrumentation and telecom equipment, among others.

### **Choosing the Software**

In October 1998, after years of using personal computer (PC) spreadsheets and graphs to monitor production quality, WECO began using an SPC software package named Synergy Enterprise Quality Management (EQM) from Zontec Inc. (Cincinnati). Before purchasing it, WECO researched SPC software vendors to get comprehensive knowledge of the software features that were available.

WECO'S need for SPC software was essential. The target was to invest in improved manufacturing processes to enhance capabilities and increase quality rating. Zontec's SPC software allowed WECO to increase control and slash defects.

### **How It Works**

The three-tier SPC software package features operator, engineer, and manager-level programs. At the operator's tier, measurement data automatically enters the Synergy software via a Mitutoyo gauge setup. Operators view the production status via green-yellow-red status flags or control charts, or both simultaneously. Green status flags indicate within spec; yellow means potential nonspec; and red is out of spec.

Other details that appear include identification numbers and corrective actions. A query function allows operators to extract data by lot number, operator identification, time/date or certain combinations of critical identifiers. The result is instantaneous analysis, enabling operators to take the appropriate corrective action. Typical operator corrective actions usually focus on machine adjustments.

The software's second tier permits engineers and technicians to create, modify and customize job setups. The third tier, the plant manager's level, acts as a "command center" of sorts. Mouse clicks at this level show how in or out of control each process is at every workstation on the network. This tier also generates enterprise-wide summary reports.

### **Installation**

The installation requirements for the SPC software were clear – easy integration. WECO wanted to avoid finger pointing among its information systems personnel, the software

manufacturer and the data acquisition hardware manufacturer. To prepare for a smooth transition, WECO installed a server, new computers, LAN lines, multiplexers and measuring instruments during a 10-day period. Zontec provided training, support, software and multiplexers.

### **Manufacturing Today**

The SPC software is installed in six computers on the production line to monitor connection dimensions and machinery performance. Mitutoyo gauges attach to the computers to take automatic readings from the manufactured parts, resulting in hefty timesavings over manual entry. Production machines are evaluated in real time, being stopped and adjusted when necessary. The result is fewer defects and better machine output diagnostics.

Several diagnostic tools are in use on the production floor, including X-Bar & R, attribute, Pareto, and gauge repeatability and reproducibility (R & R) charts. Capability and performance indices of Cpk, Cp, Ppk and Pp can be accessed during and after production. Cp and Pp show how capable the process is in making parts that are within engineering specs. Cpk and Ppk are measures of how centered the process distribution is when compared with specification limits. Real-time monitoring and subsequent adjustments are now getting substantially more products through final inspection.

Before WECO began using SPC software, nonconforming parts were causing rework, repair and scrap, in addition to lost time and missed delivery windows, but no more. Heiner Kammann, president of WECO, sums up the SPC before and after picture: "Not purchasing the [SPC software] would inevitably lead to a loss of clients and higher expenses. With the software, we can control the process and avoid lack of quality in components."



### **Driving Your Business with Commonsense SPC**

Are you too focused on fixing everyday problems to make a real impact on your company's bottom line? Steve Gruler, a Zontec software advocate for more than 10 years, and now President of Global Quality Consultants, L.L.C., says it's possible to reduce costs, raise the bar on Quality and do both exceptionally well.

Gruler recently shared his corporate-level experiences using Synergy 2000™ SPC Software during a visit to our Cincinnati offices. According to Gruler, many companies are so frequently distracted by daily routines that it becomes very difficult to realize the issues and problems they encounter are a result of processes not being capable or stable. Once they can make this connection, SPC becomes a powerful tool and major factor in their success.

Gruler knows success firsthand. In his role as Director of Corporate Quality at several Fortune 1000 companies, he has seen Synergy 2000 lead to double-digit reductions in product costs. Another of his employers improved its processes from a 3 Sigma level to a 5 Sigma level within 24-months of implementing Synergy 2000. He has also used Synergy 2000 to provide timely crisis management data and eliminate product recalls. His philosophy is simple but highly effective, when the right tools are available.



Managing quality happens in Production, and for individuals on the shop floor, he provides these words of advice: "Don't get caught up on being a statistician. You don't need to know the definition of standard deviation, how to calculate control limits, and all the technical pieces of SPC to be effective. Instead, think 'how I can predict and prevent production issues?' Literally anyone can sit down and look at the picture (chart) in Synergy 2000, and come up with the right conclusion to the questions: 'Is my process stable? Is it shifting up? Is it shifting down? Is it erratic?'

"Quality Managers can even build in pre-determined corrective actions for Production staff based on what Management would like to see happen. For example, depending on where the data falls, do you want the Operator to adjust the machine, check incoming materials, or call a Supervisor? This approach makes users realize they have an important real-time resource, giving them a 'heads-up' whenever a negative situation starts impacting the business," he points out. "As soon as you see a problem, you can be proactive about the solution."

From the production data, Engineers and Managers can then begin to chart a course for continuous improvement, says Gruler. Just knowing the parts per million (PPM-Six Sigma) quality levels enables these users to start building process capability by analyzing the data and determining what changes are necessary to increase yields and lower the defect rates. "You can really get to know your process with Zontec. The software encourages you to think in terms of 'what can I do to reduce costs while maintaining or increasing the level of quality. You can drive to PPM levels of quality with Zontec by improving your process, whether it's related to ingredient testing, materials, machines, or personnel training."

**"I've looked at six to a dozen different SPC programs, and the company that best supports the commonsense approach and focuses on driving the business is Zontec."**

**- Steve Gruler**



Once Synergy 2000 is on board, companies discover that its benefits just keep on coming. Being an enterprise networked system, Synergy 2000 becomes a valuable troubleshooting and training vehicle - a function that other software programs don't fully exploit, explains Gruler. You can go online and work with various Quality, Manufacturing and Operations personnel to assess the situation at any of your locations. You can see the actual process real time and collaboratively analyze the root cause on the spot: was it a change in ingredients, in Operators; did a piece of equipment need adjustment? You can talk them through the fix and advise them to tag the action to that particular data point for archiving and future design purposes. This capability is very valuable as a training tool for the development of personnel.

"In the same manner, you can go into the system to look at each location for an update on how each one is doing for the day, what their month looks like, what products they're having problems with. If you see two facilities having similar problems, maybe you've got a formulation issue that needs to be addressed. If they're using the same equipment, maybe it's an equipment problem. If one location is not having an issue and another is, what can we learn from the location that is doing well? It's an extremely powerful monitoring and communication tool."

Gruler thinks a promising but untapped application for Synergy 2000 is in the new product development arena. "Synergy 2000 lets you roll new products out to your production facilities and deliver quality faster and with minimal issues if this tool is used in the commercialization process." By using Synergy 2000 on trial runs, Process Engineers and Product Developers can make adjustments early on and discover if the product can meet their specs. On one occasion, Gruler remembers one company that was able to reduce product costs by 12% within four months of startup by reducing their ingredients. "They were very capable, had very little variation, and consumers could see absolutely no difference in product performance between these spec ranges. So rather than running in the middle of the range, they just moved to the lower end to capture the savings."

To succeed, businesses need to "learn what's key to the customer; build that into the product; measure it; control it and deliver it. It doesn't matter if it's widgets or food or medical devices or aerospace. I've looked at six to a dozen different SPC programs, and the company that best supports the commonsense approach and focuses on driving the business is Zontec," he concludes.

Gruler describes one company that was experiencing product recalls, and did not know the precise level of quality "that was going out the back door." They based their quality on whether customer complaints were going up or down. It was a very reactive system that couldn't deliver product quality data until three months or so after the fact. With Zontec, using a commonsense SPC approach, for the first time they were able to set PPM quality goals and expectations and compare those with actual quality levels they were delivering. It thus became a tool to drive the corporate quality metric that is used from the shop floor throughout the plant to the regions to executive management. "It was a big shift in philosophy for them," he says.