

Customer Response

In our last QC Report we featured an article titled "The Abomitable Snowjob." In this article issues were discussed regarding Cpk and Ppk. We would like to share a response from one of our customers upon reading this article.

"I am a manager in a Nuclear Energy facility. After reading your article in the latest edition of the QC Report, I decided I was not really clear on the point you are making and would like some additional information. I have always thought that looking at the Cp in combination with the Cpk was a reasonable way to assess process capability and more particularly whether a lack of process margin was being driven by variability, lack of centering or both. In addition, I think that I understand the difference between Cp/Cpk & Pp/Ppk but would be interested in more information if you have it. In the article graph, you made the point that although the Cpk was high, the process was not centered; you equate this with poor quality. Why? Should I not be satisfied if I have high assurance that the design spec limits are always met? Thanks for the thought provoking article! I will look forward to your response as well as any additional reading material on this subject.

Stochos' response via Don Holmes: I will tackle the issues you have raised regarding the article in order of occurrence.

1. Use Cp and Cpk together. That's certainly an improvement over just using one of the measures. The Cp is simply a standardized measure of the process width which is independent of any indication of process center. The Cpk is, on the other hand, a measure which confounds process center and process width - which is why my diagram has a large Cp as well as a large Cpk - but the customer did not get a single unit that was anywhere close to his specified nominal value. Just meeting spec limits is okay PROVIDED there is no nominal value given as a part of the specs. If the nominal lies halfway between the USL and the LSL, the confounding is readily seen by the formula:

$$Cpk = Cp - |Cn|$$

where $Cn = (\text{Nominal} - \text{Average}) / 3 * \text{Std. Dev.}$ The first term on the right measures width. The second term measures deviation from process center.

Obviously, the Cpk is a confounded measure. If the nominal is not halfway between USL and LSL, the degree of confounding is not so easy to determine. The safe way to handle the

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NEW & DIFFERENT

"Spec" Charts Rather Than "Control" Charts! (Avoid beating a dead horse)

"Is my process meeting specs?" and "Is my process average stable?" are two rather different questions - with rather different approaches to achieve the appropriate answers.

The first question calls for the use of Acceptance Charts. The second question calls for the use of Control Charts. SPC Direct now has made Acceptance Charts for Xbars and EWMA's available for your use.

Why bother?

There are many process situations where the capability standard deviation is essentially stable, (R chart or s chart in control) with a value that is very small relative to the allowed width of the process (USL - LSL). In this case, it may be perfectly ok to let the average value wander as long as it does not get close enough to the spec limits to produce an unacceptable product.

Sometimes you should let your process wander using an Acceptance Chart and save your Control Charts for cases where the capability standard deviation is large relative to the allowed width of the process. In this case you should use Control Charts to find and get rid of the causes for the large standard deviation.

(For further information on Acceptance Charts, please see Holmes and Mergen on our website @ www.stochos.com)

SPC Direct

Stochos SPC Direct™ Integrates with DataMyte™ InterGage Card

Beneficial to Manufacturers

Stochos is proud to announce the latest release of **SPC Direct for Windows™** with integrated data collection capability through the use of **DataMyte's InterGage™ Cards**. The new functionality will provide InterGage Card users with a simplified method for collecting SPC data and real-time monitoring with the use of multiple measurement devices.

DataMyte's InterGage™ Card provides a fast, easy-to-use solution to collect data from virtually any type of digital or RS232 measurement device. With up to four expansion ports per card, the need for bulky extra hardware to connect gages to a PC is eliminated. "The InterGage Card lets the user seamlessly integrate serial gages with a PC running data collection software," said Erich Schroeder, DataMyte Marketing Manager. "It eliminates the need for an external power supply or an available serial port."

Stochos' SPC Direct™ is unique in the real-time world in that it *simultaneously* updates all SPC charts and associated calculations as the data is collected. All violations of control tests and/or specification limits are immediately conveyed to the operator via an on-screen alarm. The integration provides an automated solution with features such as cause-of-failure and corrective action tracking, important to quality improvement efforts. Konnie Steele, Stochos' Marketing Manager said, "The benefit is for the manufacturers who want to improve their process through real-time SPC capability and need to utilize multiple measurement devices to collect data. The integration of these two products is essential."

Moving SPC analysis to the shop floor allows one to detect and respond to process shifts as quickly as possible, thereby saving time and money through increased efficiency and reduced scrap rates. **If your goals are process improvement and increased profitability, we have your solution.**

For additional information, please contact Stochos: www.stochos.com or DataMyte: www.datamyte.com

problem is to calculate the Cn to tell you how well the process is centered - regardless of existence of symmetrical limits - and the Cp to tell you how well the variability matches the required amount (USL - LSL).

2. Distinction between Cp and Pp. The definition of Cpk includes (in fine print) a statement to the effect that the process must be in control to use the "capability" measures. However, if the process is not in control, one can still use the concepts to describe the actual process output which was shipped to the customer - not what the process was capable (C) of shipping but rather what performance (P) of the process delivered. The C values are based on a standard deviation estimate like $Rbar/d2$ or $Sbar/c4$ whereas the P measures are based on the usual $\sqrt{(\text{Sum}(X - Xbar)^2/(n-1))}$ standard deviation estimate. If the process is in statistical control, these two different estimates will be approximately the same.

3. Process not centered being a low quality process. IF there is no nominal value given, THEN just having product which falls inside spec limits is high quality. On the other hand, IF a nominal value is given, THEN that is the customer's most highly desired value and not having any product close to the nominal value constitutes poor quality. I was once the chief inspector for the Army Chemical Corps. We had specifications which included a nominal value. A histogram of the material we received from one supplier looked almost Normal - but with all of the center of the curve missing. They were shipping the sweet stuff to the air force. We certainly had to accept that lot - but we did not have to do any further contracts with them - the quality was not acceptable.

* Any rebuts and suggestions are welcome.
Please check out our website for more information on several interesting new products.

Stochos now offers on-line product demonstrations
All you need is a phone & an internet connection!
Just call us to set up an appointment.

Stochos and PivotPointSW form Agreement to Provide Integrated Quality with Point.Man ERP

Schenectady, NY, December 29, 2000 - Stochos Incorporated and PivotPointSW have announced an alliance to integrate the Point.Man ERP system with Stochos' Statistical Process Control (SPC) and Quality Action Request (QAR) software. The alliance will provide Point.Man customers with integrated closed-loop Nonconformance/Corrective Action tracking and both on-line and off-line SPC capability. The complete solution will help promote quality improvement and reduced yields through better communication between business system and factory-floor.

Stochos' President, Donald Holmes said, "Stochos welcomes the opportunity to work with PivotPointSW to deliver an SPC system integrated with their ERP to their clients. The team at PivotPointSW has clearly demonstrated both its capacity and willingness to make the integration a successful reality. We look forward to a great partnership with them."

PivotPoint Southwest Co-Founder and Vice

President of Sales, David Roper added, "We are very excited about our partnership with Stochos. We believe the addition of their Statistical Process Control (SPC) and Quality Action Request (QAR) software will be a significant competitive advantage in our target markets. The Stochos Quality product suite has been extremely well received by our customers and prospects that have not been able to find cost-effective quality management software in other ERP solutions."

Stochos' QAR is a Closed-Loop Corrective Action Tracking system that has proven to be successful in satisfying ISO 9000 standards for the Control of Nonconforming Product, Nonconformity Review and Disposition, and Corrective Action. The QAR incorporates all types of Quality issues (Customer, Vendor, In-Process, Safety, Quality Audit, etc.) into a closed-loop system that requires action from all appropriate personnel.

Stochos' SPC products Custom/QC and SPC Direct provide on-line real-time shop-floor data collection and off-line SPC/SQC analysis capability. The shop-floor interface can accept both manual and direct gage input as well as automatically poll larger process control data acquisition systems. Up to 32 SPC charts are automatically updated, providing instant

Stochos Summer Software Sale

Sale Ends August 31, 2001

(Offer available to New Customers Only)

Custom/QC is a multi-purpose, SPC/SQC analysis and reporting package that offers a wide variety of control charts and analysis tools to help you meet your specific quality needs.

Features include: Non-Normal Data Analysis
Capability Indices (Cp, Cpk)
Performance Indices (Pp, Ppk)
Descriptive Statistics
Gage R&R
Control Charts

Network Version Available!

Custom/QC DOS users receive a 20% discount off the regular upgrade price when ordering.

Payment Methods:

Purchase Order # (must be received in advance to ordering) or Visa/Mastercard.

For more details or questions regarding Stochos software... Please call (800) 426-4014, fax: (518) 372-4789, email: sales@stochos.com, or visit our web page @ www.stochos.com

feedback alarms for out-of-control and/or out-of-specification conditions.

Point.Man is a powerful extended enterprise application that streamlines business processes for manufacturing, customer service, engineering, supply chain planning and financials. The solutions support international and multi-site operations on platforms spanning Windows NT, UNIX and Linux. The seamless integration of these solutions will save time and money by eliminating the paper trail burden for document flow and reporting procedures. Other benefits include improved quality, reduced waste and operating costs, and higher yields.

In business since 1968, Stochos is a leading supplier of highly computerized software solutions that emphasize quality improvement and significant cost savings for manufacturing and their processes. Stochos can be found on the web at <http://www.stochos.com>

Founded in 1998, PivotPoint Southwest is a rapidly growing software solution provider intensely focused on the mid-sized manufacturing and distribution marketplace. The company delivers a total solution offering advanced business applications for the enterprise, along with any required services for education training, implementation consulting, conversions, customization and integration services. PivotPoint Southwest can be found on the web at <http://www.pivotpointsw.com>