



## SPC Does NOT Work Here

by John J. Flaig, Ph.D.

You might be surprised how often the idea that somehow our process is unique and SPC just doesn't work here crops up. Now, one should always keep an open mind (i.e., there might be processes where SPC does not work), but the problem is usually that they have never tried to apply SPC or if they have, they have done a poor job of selecting the appropriate SPC tool.

This brings up an interesting example from my past. Once upon a time, there was a company that spent years and thousands of dollars developing a real-time process monitoring and control tool. Of course, they had a graphic display of the time series data and had generated control limits based on the prior performance of the process. They were plotting averages on their control charts and had used the proper Shewhart formula for X-bar and S charts. The problem here was not that these people wanted to claim SPC didn't work, they were trying hard to make it work and they were smart and hardworking people to boot. So what was the problem?

The problem was that they failed to understand the fundamentals of control chart theory and so they were well on their way to creating a failed control system. So, if you were in management and your best people were spending lots of money, produced something based on SPC that failed to work, what would you conclude? I think it would be reasonable to conclude the SPC just doesn't work for our process.

However, the real problem was that they did not understand their process and the underlying control theory. In this case, the data was taken quite rapidly via automatic data acquisition sensors. Such data often exhibits autocorrelation and Shewhart control charts require independent observations. Now as it turns out there are several process control techniques that can be used to control autocorrelated processes. The standard X-bar and S chart approach that these people were



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using would fail because the autocorrelation would cause sigma for the process to be underestimated. This would result in narrow control limits and many points would fall outside the limits. Of course operators and engineers would investigate and perhaps even adjust the process based on the false signals. This would have the same effect as tampering with the process. So instead of making the process better the program they embarked on would have actually made things worse.

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