



EXPERIMENTAL DESIGN GONE AWRY

by John J. Flaig, Ph.D.

Consider the following DOE process development rule:

One point - is a Theory,

Two points - is a Trend,

Three points - is a Process!

Guess what? I wish this was a joke, but I've seen it many times. The experiment gets started, a few run results come in and they conform to someone's preconceived notion and BANG we stop the experiment and roll the "improved" process into production only to get a nasty wakeup call later when it fails. Or the experimental results are different from the preconceived notion (or they seem to point in a new direction) and BANG every thing gets changed. Let's modify the experiment and explore a different region of space. Now we generate a few more runs and the results indicate that the desired response can be achieved by adjusting certain variables. This sounds good and conforms to those preconceived notions about what should happen. Therefore, the "improved" process is rolled out, only to find that the results in actual production differ significantly from the experimental model. Of course this is explained by the "fact" that those ill-trained production operators can not follow instructions.

Reality check – Yes, doing experimentation is a sequential process, but it is supposed to be a rational sequential process. First, more effort should probably have been expended in design of the first experiment. Second, the first experiment should not have been abandoned so quickly, because the data from it might prove insightful. Third, when the second experiment is formulated it requires a



significant amount of thought in the design phase. Also, it needs to be a complete experiment not just a few runs.

Remember, three points don't make a process unless you are very lucky! Have you won the lottery lately?

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