Case study 7

Statistical analysis of effluent data:2

OUR APPROACH

We believe passionately that SPC techniques are highly effective in this type of project. We've got substantial experience of many different techniques and we work carefully to make sure we use the right techniques for each client. That means each SPC analysis we do is different but our clients can be certain that it is also the most appropriate for them.

TECHNIQUES WE USE

We use techniques ranging from simple run analysis (as we did in this example) through all forms of data analysis to more complex multivariate techniques and modelling approaches such as evolutionary algorithms. Sound a bit too advanced for a trade effluent consent? Not at all. Each technique plays a role in helping clients comply with consents, select the right equipment and reduce costs.

BENEFITS

Our client has been able to identify possible causes of poor effluent quality. This may well help them to change how they work so that effluent quality is improved substantially with little cost incurred.

Statistical analysis of data is an invaluable tool for investigating the causes of poor effluent quality. If enough data are available then statistical techniques may be able to isolate the precise cause of a problem but sometimes, as in this example, it's enough to be able to say that trends in effluent quality have an *assignable cause* and are not just random variations in measurements.

The client in this example is a food processing company. Although the quality of the effluent was causing concern for the local water company, there was some doubt about the cause of the problems. In particular, attention was concentrated on whether poor effluent was associated with one-off events in the factory or a more consistent and regular activity. We were asked to analyse the client's effluent data to see if we could find the answer.

We used a technique borrowed from statistical process control (SPC): run analysis. This entails plotting a simple time series of a variable and comparing how many times it falls below or exceeds a certain value. In this case the value of interest was the trade effluent consent limit.

The run analysis, carried out using our in-house spreadsheet tools, revealed that poor effluent quality had a definite assignable cause. There was also a very strong suggestion that the cause was a regular activity in the factory. Analysis of the client's records have shown a small number of candidate causes and work is now going on to change those activities and bring effluent quality back under control.

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