

Designing an Economic X-Bar Chart Model Using a Quadratic Loss Structure

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In this study, a new modeling approach for the economic design of x-bar control chart (EDCC) using a quadratic loss form is proposed. One specific drawback imbedded in conventional quality control models is the assumption that the cost of quality depends merely on whether or not a product measurement falls within specification limits. The loss form suggested by Taguchi and defined by the squared difference between a measurement and its target is seen to offer a good alternative for overcoming this. Actual incorporation of Taguchi's loss form into the EDCC model for process control with the assumption that production continues while a problem is searched for and repaired is performed. One of our main results is that process variability is one of the most important sources of loss and that costs can, in the long run, be significantly lowered by reducing this variability