A Study of Economic-Statistical Design of MA Control Charts

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ABSTRACT

The control chart design involves the determination of the optimum values of the three control parameters: the sample size n, the sampling interval h and the width of control limits k. The general approaches for the design of control charts are statistical design and economic design. The statistical design neglects the economic factors, and the economic design gets worse statistical performance. Therefore, the combined model will be better than statistical or economic design alone. A model of economic-statistical design for an MA control chart is constructed in this study. It is based on the design of MA control chart from the economic view-point under the consideration of statistics. The Grid search method is employed to find the three design parameters of this model. A numerical example is also used to demonstrate the model's working and it indicates that the economic-statistical designs have higher cost than economic design, but it can provide better protection in statistics. Sensitivity analysis shows that the cost is lower when it has larger shifts. Also the occurrence rate of assignable causes and the penalty cost when the assignable causes have the significant impact to the expected loss cost.

Keywords : MA control chart ; Economic design ; Economic-statistical design

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