

## ABSTRACT

A Process Control Chart for the Detection  
of a Change in the Level Parameter of the  
First and Second Order Autoregressive Processes. (May 1994)

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Control charts are an important part of the quality program of many industries. Their ability to identify special-causes of variability and monitor process parameters is used to identify process improvement opportunities. Inherent in the construction of control charts for variables is the assumption that the process is a normal distribution with independent and identical observations. Continuous-flow process often have autocorrelated observations which violate the independence assumption and render standard control charts for variables unreliable.

The objective of this dissertation was to develop a control chart for detecting a change in the mean level of a process with autocorrelation for the first and second order autoregressive processes. The control chart is developed from implementing the hypothesis test for the change-point problem to monitor the level parameter. The resulting test statistic is CUSUM which can be implemented as control chart.

The performance of the new control charts will be examined using the average run length. The average run length will be evaluated using the Markov chain approach allowing the performance of the new control charts to be compared to those given in the literature.