

Statistical Optimal Design of Control Charts with Supplementary Stopping Rules

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ABSTRACT

This paper deals with the statistical design of control charts and describes a methodology to identify control schemes with action and warning limits that, for a fixed in-control average run length (ARL), minimize the ARL at a given out-of-control situation as measured by a shift in the process mean. This methodology allows the design of control charts with improved ARL performance for moderate shifts without degrading the in-control ARL as typically happens when run rules are applied to a conventional control chart. These optimal control schemes significantly reduce the out-of-control average run length when compared to nonoptimal schemes.