

A New Variables Sampling System Based on Exact Sampling Distribution

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Abstract

The aim of this paper is to develop a variables quick switching sampling system based on exact sampling distribution when the quality characteristic follows a normal distribution. Quick switching system (QSS) was firstly proposed by Dodge in 1967 for attribute data, which is one of the two-plan systems. In any two-plan system, the tightened inspection can be used when the quality of a product deteriorated and normal inspection is used when the quality is found to be good. The operating characteristic (OC) curve of the proposed sampling system is derived based on the exact sampling distribution and the OC curve is required to pass through two designed point, acceptable quality level (AQL) and limiting quality level (LQL). This implies the plan parameters (n , kT , kN) are determined by solving two nonlinear equations such that the producer's risk and consumer's risk can be satisfied simultaneously. The behavior and performance of the proposed sampling system is discussed and also compared with the conventional variables single sampling plan. The computation result shows that the proposed plan is more economic in terms of getting smaller required sample size for inspection. And the decision could be made more reliable since the proposed method derived based on the exact sampling distribution rather than approximation approach. For practical use, tables of the plan parameters are provided.

Keywords

Quality characteristic, operating characteristic curve, sampling system, acceptable quality level, limiting quality level.

Biography

Jhih-Jia Lin is a master student in industrial management at National Taiwan University of science and technology. He received his bachelor degree from the department of industrial engineering and management at Yuan-Ze University, Taiwan. His research interests include quality management and process capability analysis. His e-mail is m10101106@mail.ntust.edu.tw.

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