A hypothesis testing procedure on assessing process performance

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Abstract

Process incapability index has been introduced to provide quantitative measures on process performance. Investigations of the estimated incapability index based on multiple samples have been proposed and arrested substantial research attention. In this paper, investigation based on multiple samples is considered for normally distributed processes. A reliable inferential procedure based on the *Uniformly Minimum Variance Unbiased Estimator* (UMVUE) of the incapability index is proposed. Useful critical values required to ensure the process reaching a certain desirable level of the time are also tabulated. A practical example is provided to demonstrate how the proposed procedure may be applied for judging whether the process runs under the desirable quality requirement.

Keywords : *Critical values, incapability, inferential, UMVUE.*

1. Introduction

Process capability indices, whose purpose is to provide numerical measures on whether a manufacturing process is capable of reproducing items satisfying the quality requirements preset by the engineer or the product designer, have received substantial research attention in the quality control and statistical literature. The three basic capability indices C_p, C_a and C_{pk}, have been defined as (Kane [5], Lin [12, 13], and

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