

Siraprapa Manomat 2012: Process Capability Analysis for Comparing Multiple Suppliers Focusing on One-sided Specification Limit. Doctor of Engineering (Industrial Engineering), Major Field: Industrial Engineering, Department of Industrial Engineering. Thesis Advisor: Associate Professor Prapaisri Sudasna-na-Ayudhya, Ph.D. 189 pages.

This research proposes to develop the method for comparing process capability which is used for selecting multiple suppliers. The method consists of two cases namely: considering only quality factor, and considering quality, delivery time and price factors. The proposed method uses for univariate quality characteristic and normal distributed processes focusing on one-sided specification limit.

In considering only quality factor case, the method is constructed by a modified hypothesis testing of inverse coefficients of variations. Performance of the method are investigated in actual Type I error and actual power of the test and compare with Chou and Hubele method (2suppliers) and compare with Hubele (3, 4 and 5 suppliers) for significant level 1%, 2.5% and 5%. In considering quality factor with delivery time and price factors case, the method is constructed by a modified loss function for creating total expected loss from three factors. Performance of the method compared with process capability index.

The results of considering only quality factor case show that the proposed method provides actual Type I error less than Chou and Hubele. For actual power of the test, the proposed method is less than Chou and Hubele method for small sample size ( $n \leq 50$ ). For large sample size, the actual power of the test is equal to 100%. This research determines an appropriate sample size for the method. For considering quality factor with delivery time and price factors case, the results show that the proposed method is appropriate when quality loss and delivery time loss are affected to the process.

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