

# PROCESS CAPABILITY ANALYSES BASED ON RANGE WITH TRIANGULAR FUZZY NUMBERS

S. SELVA ARUL PANDIAN<sup>1</sup> & P. PUTHIYANAYAGAM<sup>2</sup>

<sup>1</sup>Assistant Professor, Department of Mathematics, K.S.R College of Engineering, Tiruchengode, India

<sup>2</sup>Professor and Controller of Examination, Department of Statistics, Subbalakshmi Lakshmipathy College of Science, Madurai, India

## ABSTRACT

Process Capability Indices (PCI) is an effective and excellent method of measuring product quality and determine whether the production process produce product within the specified limits.  $C_p$ ,  $C_{pk}$ ,  $C_{pm}$  and  $C_{pmk}$  are most used traditional process capability indices. In this paper, the fuzzy set theory concept is used to extent the process capability analyses by using the range (estimate of  $\sigma$ ) and fuzzy midrange transform techniques to get more information and flexibility of the PCA system. The fuzzy tolerance control limits for  $\tilde{C}_{pk}$ ,  $\tilde{C}_{pm}$  and  $\tilde{C}_{pmk}$  are developed and compared their performances with a numerical example. The result shows that the  $\tilde{C}_{pk}$ ,  $\tilde{C}_{pm}$  and  $\tilde{C}_{pmk}$  control limits are the evidence of improvement in the process performance.

**KEYWORDS:** Fuzzy Range Control Limits, Fuzzy Tolerance Limits, Process Performance Fuzzy Limits, Process Fuzzy Control Limits, Triangular Fuzzy Limits