Quality Improvement in Engine Assembly through Six Sigma Approach

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Abstract:
Focus on reduction of process variability and non-conformance is necessary to sustain a competitive edge in manufacturing sector. Technological advancements and globalisation has a significant influence on the quality of a product. Quality improvement is unlike quality control, it is to enhance the quality of the product through process improvement and variation reduction. The key for a business to achieve lower production costs and higher customer satisfaction is by managing quality effectively. Due to various reasons defects tend to occur in the manufacturing process and these can be eliminated using six-sigma.

To maintain high quality levels, brand image and customer satisfaction- quality improvements were carried out in the engine assembly using the five phase DMAIC approach. Problem was defined by selecting the critical issues of quality in the define phase. Data was collected to determine the current performance in the measure phase. Root causes of engine leak were identified in the analysis phase. Solutions were identified and implemented in the improve phase. Various documents were updated to control the process and to sustain the improvements during the control phase. Benchmarked practices and best process across the industry were sought for the corrective measures to eliminate the sources of leak defects in the engine assembly.

The main result of the project was an improved, right first time process and quality levels of engines produced. The defects in engine assembly due to leakage from various components were reduced from 17604 to 2727 PPM - 84.5% reduction. Savings and associated benefits were manufacturing costs reduced from Rs 20.4 per engine to Rs 9.18 per engine as sealant consumption was reduced and 24 seconds cycle time reduction through introduction of multi-spindle and robo sealant application. The elimination of rejects and reworks has reduced rectification operators from 2 men per day to 1 man per day.

75 % reduction targeted, 84.5 % achieved

Reduction in defects in engine assembly