

QUALITY MANAGEMENT THROUGH SIX SIGMA APPROACH

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Abstract: This project is a pure analytical research to manage the product in quality in mass production centre to reduce the rejections with modern techniques of six sigma approach. Now-a-days the mass production centre reducing the rejections in PPM level in parts per million instead of percentage . One percentage rejection makes only one part per hundred numbers, legally it shows very less but in mass production centre it is ten thousand parts per million which is very huge quality. To reduce the rejections by PPM level, six sigma approach is the best and approved method in any kind of product that too in Automobile accessories manufacturing area.

This project deals with a mass production automobile accessories manufacturing company to analyze, their rejections and reduce them by PPM level. Giving suggestions with proper evidence to the management to implement the facilities to improve the quality of the product . SUPER AUTO FORGE LTD , Medavakkam given their rejection and production quality of recent month to analyze, with their product and different types of flaws. We have analyzed the various process and the rejections generated during the process. Various design of experiment and quality tools applied in analysis and them to maintain for that visit to the company to get the evidence in physical.

1. Introduction

Any competitive company must be aware of and put to good use the best methods and processes possible in order to ensure quality of their products or services and in effect enhance profitability for their business. It is understand that the customer satisfaction must be done primary goal of any organization. Therefore it is essential that every employee in an organization should understand the importance of the customer and their need particularly the quality of the products or services. The Six Sigma methodology is used to find out the solution of the reduction in Internal Rework & Rejection in process of piston to 100 PPM. The solution for the statement of the problem is found that defects are not cause by CNC machining and Rough

Grinding by various QC tools & DOEs through Six Sigma approach.[1]

2. Literature Review

2.1 Literature Review-1

Implementation of Total Quality Management Model

Written by: Eric Zuendoki Edited by: Matthew McCarth
Total Quality Management involves all functions within an organization, accompanied with the concept that quality is affected by all divisions, departments, and operations in an organization. In recent years, TQM has become the primary approach for organizations to understand and address the dimensions of their systems that affect quality. From small industrial companies to Fortune500 organizations, Total Quality Management has become a fundamental theory and practice, enhancing quality improvement initiatives into more developed and detailed quality models. These TQM concepts have the power to increase the profitability and competitive-edge of an organization, as well as support a healthy and structured company environment. Despite these improvements offered by TQM, the implementation of a TQM model into an organization is not as simple as believing in [2]TQM theories and placing the model into practice. Although the benefits and rewards from implementing a total quality management system are clear and distinct, the methods of implementing a complete TQM model into a 14 company have less definition and detail, and at times, none at all. As the manufacturing community began accepting the notions of Total Quality Management, many management employees began attending conferences, seminars, and courses teaching the characteristics and concepts of a total quality management system (Aravindan & Devadasan, 1996). The industry began to pay close attention to quality management experts due to the potential advantages of implementing a total quality management model into their organizations. This trend began to spread into the global market approximately thirty years after the birth

of total quality management in the 1950s, and many corporations began to implement TQM concepts into their processes and management disciplines. However, According to Aravindan and Devadasan (1996), ten years after the TQM movement gained momentum, manufacturers and quality managers started to re-examine the real benefits accruing from it. In this context, it was realized that exhaustive research work, covering the study of the present status, with a firm commitment to develop practical implementation strategies of TQM, was found to be necessary.[4-10]

2.2 Literature Review-2

Organizational & Educational Training

Written by: Eric Zuendoki Edited by: Matthew McCarthy

Training Theory

Training programs and educational courses are very similar in that they are both focused on combining the practical nature of a task and the theory and concepts behind a task; teaching them simultaneously to maximize the thoroughness of the information offered. According to Tickner (1966), it is appropriate to begin an examination of the intimate association between education and training at the higher levels of education because, in most of the professions, university study is involved. When a training program loses its connection with high level education, the material also loses its educational value and only maintains its practical nature as applicable to the guidelines set by the organization that the training program is in. It is important that any training program offer material [11-18] from the educational background of the focused topic because of the enhancement to learning this material can create. Conceptual theory and ideologies of certain topics should not be left out of the training program because of their contribution to the understanding of practical applications in a broad sense. In some cases, it may be necessary to implement sections into the training program that focus on theory instead of practical application because it will enhance the ability for the individual taking the training program to learn and understand the material. [19]

Designing a Six Sigma Training Program/Educational Course

With regards to Six Sigma, the level of detail that a training/certification program or academic course has differentiates the type of program it is. Training programs involving the Six Sigma method need to be designed to incorporate all topics related to total quality management and organizational performance, because Six Sigma is derived from these ideas and practices.[20] In

addition, a training program should be designed around the major components of Six Sigma theory and functions, as seen by academic institutions, the industry and corporate America, and the original inventors of the Six Sigma process. Currently, there are Six Sigma programs in colleges, universities, and independent training programs, but among these programs, different material is focused on and different criteria form the completion and objectives of the program. When designing any training program or educational course, it is necessary to target the most relevant subject matter of the topic, and focus the program on this material.[21]

3. Six Sigma

Among the most widely used business models for this sort of quality control and management is the SIX SIGMA process. The SIX SIGMA process is a business model or philosophy [22] that aims to continue enhancement of product based on customer standard . SIX SIGMA approach also focuses on quality improvement through checking products or services for the prevention of flaws. This SIX SIGMA model emphasis the implementation of company wide activities in order to motivate the designated employees[14] and teams for a higher performance. The SIX SIGMA process proves to be very beneficial when it comes to making sure that quality in products is achieved as faster rate & that customer satisfaction is maintained consistently. This process is achieved through constant good performance required of measuring up to the target customers standards and expectations.[23-25]

This then leads to higher viability and profitability for the company the company that uses the SIX SIGMA APPROACH to the QUALITY IMPROVEMENT six Sigma stands for Six standard deviation from mean. Six Sigma similar to Zero Defect (ZD) is a philosophical bench mark or standard of excellence proposed by Philip Crosby.[16]

Six Sigma methodology provides the techniques and tools to improve the capability and reduce the defects in any process. It was started by Motorola in 1987, in its manufacturing division. Six Sigma strives for perfection. It allows for only 3.4 defects per million opportunities. Six Sigma improves the process performance, decrease variation and maintains consistent quality of the process output. Six Sigma leads to defect reduction and improvements in profits , product quality and customer satisfaction.[17]

A performance goals, representing 3.4 defects for million opportunities to make one. A series of tools and methods used to improve or design products, processes and services. A statistical measure indicating the number of standard deviations within customer expectations . A disciplined, fact-based approach to manage a business and its processes. A means to promote greater awareness of customer needs, performance measurement and business improvement.[26-28]

4. Methodology

> This project "Quality Management Through Six Sigma Approach" is analytical. In this project we are going to analyze the problem and then we are going to reduce those problem by using Six Sigma method. For this project we went to SUPER AUTO FORGE PVT.LIMITED and we analyze this project [18] (Define,Measure,Analyze,Improve,Control) method. Firstly we get the data from the from the company that in which process they are getting most of the defect and then we analyze that in Grinding process they are getting defect in a large ammount.We went to the company and finished our project by using SIX SIGMA.[19]

5. Objective

The objectives of this thesis are:

- To utilize six sigma methodology in performing the study
- To study the outer diameter of pistons dimension rejection trend by utilizing QC tools as the identified grinding machine.
- To identify the root causes of the OD rejects &
- To recommend actions to eliminate rejects to sigma levels.

Overview

Six Sigma is good for business, delivering business results that can accelerate growth, reduce costs and ultimately deliver extraordinary profits to stakeholders. [20]Manufacturing industries, health care and many more sectors have adopted Six Sigma processes to improve performance and deliver customers with unparalleled quality and excellence in products, services and delivery. This paper discusses the Six Sigma methodology and the best practices to implement the same across the enterprise.[21]

6. Conclusion

Six sigma level concepts explained to basic machine operators before taking the project in super auto forge Pvt. Ltd., A team organization from AGM-QA to grinding machine tool operator level to achieve the target as zero defect quality product producing or at least 100 PPM level (BENCH MARK)[22-25].

Discussed with the team about six sigma approach and training conducted the methodology of six sigma, by which any problem solved by systematically and controlled consistently. this project title "QUALITY MANAGEMENT THROUGH SIX SIGMA APPROACH " is taken in super auto forge

Pvt. Ltd., located in medavakkam, chennai -600100. this project has focused on the major defect during the processing of grinding of piston outer diameter by centre less grinding. By DEFINE, the defect location is found in final grinding process. MEASURE phase has got the current level operating situation through control chart of operational sequence. ANALYZE the problem by selected design of experiments and some of QC tools. IMPROVE process by repair and replace of some component & accessories of grinding machine and total productive maintenance (TPM) has been carried out for the major problem occurring machine and time frame plotted for TPM to all piston related machine tool. To CONTROL & achieve the target, 100% OD snap gauge inspection in CNC turning process & run chart implemented for rough and final grinding process have introduced and monitored. this project is concluded by achieve 100 PPM level defects reduced from 3100 PPM level by constant monitoring & six sigma approach[26-30].

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