

Implementation Of Quality Management System Using Different Tools & Techniques

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ABSTRACT

The quality management practices will enable a company to achieve its goals. QMS addressing the processes surrounding the design, development and delivery of a general product or service. in order to continually improve the effectiveness and efficiency of its performance new techniques is designed. Statistical Process Control (SPC) & Failure Mode and Effect Analysis (FMEA) which will result in the production of quality products and services, rather than in detecting defective products or services after they have been produced.

Keywords — Statistical Process Control scheme, Failure Mode and Effect Analysis scheme & Quality Function Deployment scheme.

1. INTRODUCTION

In manufacturing, Quality management is an area of business that is concerned with the production of goods and services, and involves the responsibility of ensuring that business operations are efficient and effective. Traditional quality systems in manufacturing focus primarily on technical issues such as equipment reliability, inspection, defects measurement and process control. [2]. Management should also be concerned with the initiation, development, implementation, and maintenance of the quality system. [3]. The most successful application of tools and techniques was during the quality improvement team meetings & increasing awareness of the total quality[4].

2. EXISTING SYATEM

Firstly T. Laosiri hongthong and G.S. Dangayach have presented the findings of an empirical survey on manufacturing strategies implementation in new industrialized countries (NICs) [1]. Second Hsien-Tsung Liao have presented that ISO 9000 quality management system has been widely accepted and adapted as a national standard by most industrial countries. Despite

its high popularity and the urgent demand from customers to implement ISO 9000 [2].

Disadvantages of Existing System:

First is analyzed results to be interpreted by quality control specialists, MES based unmanned manufacturing environments require automation of the interpretation process. Second is facilitating the data collection process including cause and effect diagram and quality costing.

Tools	Application				
	Data collection	Problem solving	Customer/supplier relationship	New product introduction	Quality awareness
Cause and effect	✓				
Pareto analysis		✓			
SPC		✓			✓
Quality costing	✓				✓
Departmental purpose analysis			✓		
Q-mapping/ flowcharting		✓		✓	
FMEA	✓			✓	
QFD	✓		✓	✓	
Check sheet	✓				
Histogram		✓			
Scatter plot		✓			
Graphs				✓	✓
Mistake proofing		✓			

Figure 1: Analysis of Application of Tools and Techniques.

3. PROPOSED SYSTEM WORK

Inspection of liner carried out to check its acceptability those are Hardness testing - Hardness of w/p can be checked on hardness testing machine HRB/HRC/BHN.



Figure 2: Inspection & Testing Techniques.

A Quality Management System will assist a

1. Managing costs and risk
2. Increasing effectiveness and productivity
3. Identifying improvement opportunities
4. Increasing customer satisfaction

A well-managed quality system will have an impact on:

1. Customer loyalty and repeat business
2. Market share
3. Operational efficiencies
4. Flexibility and ability to respond to market opportunities
5. Effective and efficient use of resources
6. Waste reductions
7. Competitive advantages
8. Participation and motivation of human resources
9. Industry reputation

According to its requirements chemical composition of w/p can be checked on spectrometer to crosscheck whether % of metals according to the customer requirements. Spectrometer is used to check chemical properties of specimen [5].

Radius and chamfer and other remaining parameters also verified according to standard customers requirements & if required it will be rejected or reworked. Tensile testing carried out on tensile testing machine to check effect of load v/s displacement & stress v/s. strain graph according to requirements. Test bar specimen can be broken to check necking formation & their effect on specimen.

Diameter inspection can be carried out with the help of air gauges or go/no go gauges (plug) gauges. Also Vernier & micrometer can be used according to requirements. Bore dial gauges are also used. [8].

Surface finish of work piece also checked to find Ra, R.M.S., Rz, Rpk, Rk values relates to the surface finish. Generally liner is rejected in foundry due to ovality, cold shut, pin holes, blow holes, Undersize or oversize of w/p. [9].

All processes from research and development, to production, to shipping, are defined, outlined and documented, minimizing room for error. Even the process of making changes to a process is documented, ensuring that changes are well planned and implemented in the best possible way to maximize efficiency. Recommendations in the biotech industry to use XML authoring or similar software were formatting for data collection, reports, and product labeling, minimizes the risk of obsolete documents/labels being mistakenly used.

Advantages of Proposed System:

1. Increasing effectiveness and productivity.
2. Increasing customer satisfaction.

3. Flexibility and ability to respond to market opportunities.
4. Waste reductions.
5. Industry reputation.

Improved / consistent register oversight and auditor training. [4].

4. MATERIALS AND METHODS

4.1 Use of Control Plan & its applications

1. This is a description of a system for controlling parts and processes.
2. single control plan may apply to a group or family of the products that are produced by the same process.
3. Prepared for each phase of the process includes incoming, in process, final and product audit implemented requirements to assure that all process output in state of all control.
4. Prepared by multidisciplinary team.
5. Provision for customer approval.
6. Refer SPC Requirements Mistake proofing as control methods.
7. Prepared for three distinct methods Prototype, Pre launch, Production.

4.2 Phases of control plan:

1. Prototype – A description of the dimensional measurements, materials and performance tests that will occur during building of the prototype. The organization shall have a prototype control plan, if required by the customer.
2. Pre-launch - A description of the dimensional measurement, material and performance tests that occur after prototype and before full production. Pre-launch is defined as a production phase in the process of product realization which may be required after prototype build.
3. Production - Documentation of the product/ process characteristics, process controls, tests and measurements systems that occur during mass production.
4. Each part shall have, a control plan but in many cases, family control plans may cover a number of similar parts produced using a common process. Control plans are an output.

4.3 Elements of control plan

1. A future oriented strategy that improves quality productivity by directing analysis & action towards correcting the process itself so that unacceptable parts will not be produced. [6].
2. A past oriented strategy that attempts to identify unacceptable output after it has been produced & then separates it from the good output. [10].

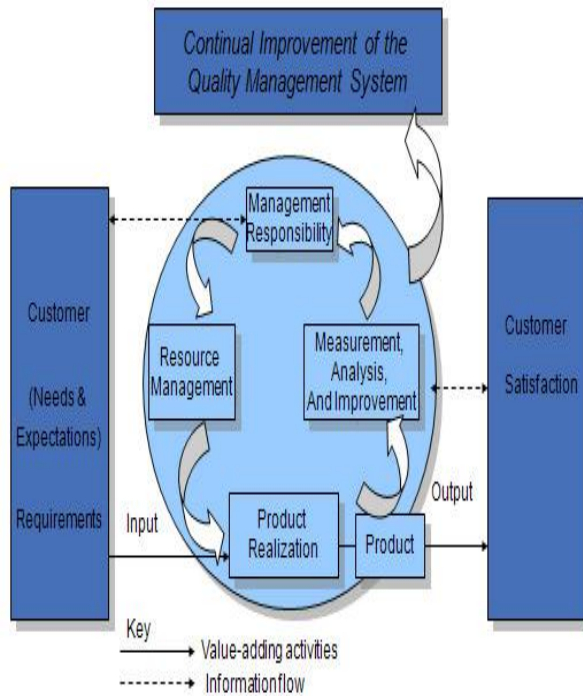


Figure 3: Process Based Quality Management System Model.

5. RESULTS

Action planned	Responsibilities
1) All Records of breakdown slips filled preventive maintenance Check sheets to be scanned and electronically controlled.	All MNM staff
2) Earlier records to be updated file with record tag identified identification	HOD MNM

TABLE1. Record Storage not effectively implemented and no control.

Details of Non conformance with objective evidence Preventive maintenance check sheets for honing m/c-wmw/ 01/02/NCR 01/03 Ref no. – ccpl / cs / 17-03 not immediately present retrieval time take a hrs

TABLE 2. Function/ Department – Maintenance Process.

Verification of action taken 1) All breakdown slips filled also its preventive Maintenance Check sheets filled also earlier records Updated with proper identification and storage Which was verified at maintenance Dept.

TABLE 3. Audit Non conformance report.

6. RESEARCH SCOPE

The scopes are focusing on certain quantitative QMS tools and techniques that been used by manufacturing industries. Types of tools discussed are:

1. Statistical Process Control (SPC)
2. Acceptance Sampling
3. Reliability
4. Experimental Design
5. Failure Mode and Effect Analysis (FMEA)
6. Quality Function Deployment (QFD)

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