



## Development of Quality Circles in an Organisation (A Case Study in Machine Shop of Tool Room, Indore)

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### ABSTRACT

*The present study/paper deals with various aspects of Quality Circle and how the productivity is to be improved by adopting quality circle in tool room, machine shop and related industries. The paper describes a case study of development of quality circle in a machine of tool room, Indore. The paper also presents comprehensive discussions of various features quality circle, improving the productivity, motivation towards work and the problem solving techniques.*

**KEYWORDS : Quality circle, Quality control, attitudes, confidence, Product, Productivity, Motivation, Carbide inserts, Grinding wheel, Fishbone diagram, flow diagram**

### 1. Introduction

Quality Circles known as Quality Control circles came into existence in the Japanese industry in the early 1960's. The QC circle was formally organized in Japan in 1962 by Japanese Union of Scientists and Engineers (JUSE) and the man who initiated the idea is Dr. Kaoru Ishikawa.

Quality circle is a small group of 6 to 12 employees doing a similar work and voluntarily meet together on a regular basis to identify quality improvements in their respective areas

Quality Circle is based upon the, Human Resource Management and Improvement of product quality and productivity

### 2. REVIEW OF LITERATURE

1947: General Douglas McArthur requested US Govt. to send experts to help Japanese rejuvenate their industries. Dr Edward Deming was sent.

1949: An Overseas Technical Research Committee was organized by the Union of Japanese Scientists and Engineers (JUSE)

1949: JUSE organized a seminar on "SQC"

1949: JUSE organized a seminar "Quality Control- Basic Course"

1950: JUSE published a magazine "SQC"

1950: Dr Deming invited to eight day Quality Control seminar organized by JUSE

1951: Deming prize instituted

1954: Dr Joseph Juran invited to Quality Control

1971: JUSE organized the first QC Circle seminar

1971: 200th QC conference was held

1971: Registered QC Circles grew to 40000

1971: First National QC Circle Conference was held in Tokyo

1972: Regional Circles grew to 50000

1973: 300th QC Circle Conference was held

1974: Registered circles grew to 60000

1974: 400th QC Circle conference was held

1975: Registered Circles grew to 70000. 500th Conference was held

1977: Registered Circles grew to 80000. 700th Conference was held

1978: Registered Circles grew to 90000

1978: First international QC Circle Convention was held

1979: 800th QC Circle Conference was held

1979: Registered QC Circle Conference numbered 100000

1980: 900th Conference was held

1981: International QC Circle Convention was held

1985: Third International QC Circle Convention was held

1988: More than one million Circles with over ten million members

### 2.2 Quality Circles (Other than Japan)

1974: Lockheed Company, USA started Quality Circle movement

1977: International Association of Quality Circles (IACC) was formed in USA

1980: 230 companies in USA had Quality Circles

1983: There were more than 500,000 known Management seminar organized by JUSE

1956: Japan's radio started broadcasting a Quality Control Course organized by JUSE

1960: Japanese Govt. declared November as Quality Month and Q-flag was adopted

### 2.1 Quality Control Circles (Japan)

1962: First QC Circle was registered with QC Circle Head Quarters

1962: First annual QC Conference for Foremen was held

1964: Regional chapters of QC Circles were organized in four different districts

1966: Dr Juran observed Japanese QC Circle activities

1966: Special QC Circle session was organized at the 10th conference of European Organization for Quality Control held in Stockholm, Sweden

1967: Number of registered QC Circles grew to 10000

1968: JUSE dispatched the first QC Circle Study Team overseas

1969: Registered Circles grew to 20000

1969: 100th QC Circle Conference was held in Tokyo

1970: Registered Circles grew to 30000 Quality Circles active in the world

### 2.3 Quality Circles (India)

1980: BHEL, Hyderabad first in India to start Quality Circles

1982: Quality Circle Forum of India (QCFI) was founded

1983: Tata Motors (formerly Telco) started Quality Circles, by 1985 they had more than 400 Circles

1985: BHEL had 1411 Circles covering around 13362 members

### 3 OBJECTIVES

- To develop quality circle in the machine shop
- To identify all problems of the work order
- To analyse the problems
- To select appropriate solutions

### It implies the

- Development of Skills, Capabilities, Confidence and Creativity of the people
- Cumulative process of Education, Training, work experience and participation
- Implies the creation of facilitative conditions and environment of work
- Creates and sustain their motivation and commitment towards work excellence



**Fig-1 Organisational Structure of Quality Circle**

**5. DEVELOPMENT OF QUALITY CIRCLE IN THE M/C SHOP OF TOOL ROOM**

Steering Committee  
 Mr. Manager (production)  
 Mr Manager (Consultancy& Market.)  
 Mr. Manager (Purchase)

Co-Ordinator  
 Sr.. Engineer ( PPC)  
**QC Facilitator**  
 Sr. Engineer (QC& Design)

**Circle Leader**  
 Foreman (Production)

**Circle Members**  
 Technician Grad1 ( Milling section)  
 Technician Grad2 ( Milling section)  
 Technician Grad1 ( Grinding section)  
 Technician Grad2 ( Grinding section)

**6. THE PROCESS OF OPERATION OF QUALITY CIRCLE**

**6.1 PROBLEM IDENTIFICATION**

The Circle Members identify a number of problems that need to be solved

a) For Work Order PT0010-15 Time to be reduced both milling and grinding operations and improve the product of the quality

**6.2 PROBLEM SELECTION**

- a) Rough Milling
- b) Surface Grinding

**6.3 PROBLEM ANALYSIS**

Why these operations are taking more time?

Due to lot of time consuming for both operations the cost of machining is increased.

The consumer cannot afford the cost of machining.

**6.4 GENERATE ALTERNATE SOLUTIONS**

The solutions may be

- a) In milling operations, the cutter material is High Speed Steel. Instead of that , the operator can use carbide cutters maybe solid or throw away tungsten carbide inserts (The cutting speed is 4 times than that HSS Cutters
- b) Minimum allowance to be given for grinding operation
- c) Grinding Wheel Selection
- d) Up gradation training is to be given to the operators those who are handling the project regarding cutting speed parameters
- e) Place high skilled technicians
- f) Change the material with permission from customer and design department without affect the material quality
- g) Offload the milling operations and Grinding operations to SSI In-

- dustries
- h) Co ordinate with purchase department for easily available material specification for eliminating raw material cutting and milling operations
- i) Change the existing machines of both Milling and Grinding machines

**6.5 SELECT THE APPROPRIATE SOLUTION**

- a)The operator can use carbide cutters may be solid or throw away tungsten carbide inserts
- b)Give minimum allowance to be given for grinding operation
- c) Grinding wheel selection

**6.6 PREPARE PLAN OF ACTION**

- a) Training
- b) Purchase of carbide cutters
- c) Purchase of grinding wheel

**6.7 PRESENT SOLUTION TO MANAGEMENT**

Upgradation training is to be given to the technicians those who are handling the project regarding cutting speed parameters

**6.8 IMPLEMENTATIONS OF SOLUTIONS**

The final process is implement the solutions to get the fruitful results .It will require support from management and the team members

**7. BASIC PROBLEM SOLVING TECHNIQUES**

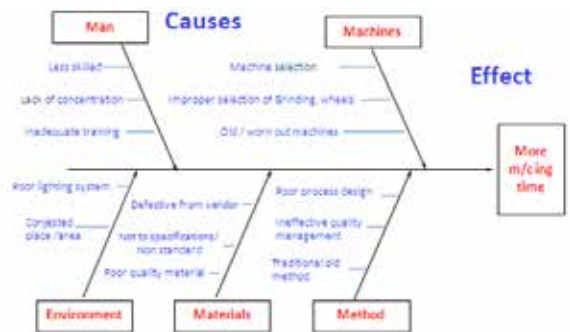
The following techniques are generally used to solve the problem in the quality circle

- a) Brain Storming
- b) Pareto Diagram
- c) Cause and Effect Analysis/Fishbone Diagram
- d) Data Collection
- e) Data Analysis

**PROBLEM ANALYSIS**

After brainstorming meeting with the team members and all related committees , it is concluded that cause and effect diagram is the optimum problem solving technique for improve the productivity in the machine shop

**CAUSE AND EFFECT DIAGRAM/FISH BONE DIADRAM**



**Fig-2 Cause and Effect diagram for improving the work order selected**

**8. REMEDIES FOR THE PROBLEMS RELATED TO THE WORK ORDER**

- 8.1 For man , up gradation training was given regarding cutting tools, material properties and allowances and are self motivated
- 8.2 For machines, QC team identified the right m/c for right job and decided for preventive maintenance is required to get accuracy and good working condition
- 8.3 For materials, QC team insisted that standard materials only pro-cured

from standard vendors

8.4 For environment , lighting systems are improved and also optimum space provided for machines

8.5 For method, traditional methods are modified and improved the quality management system

## 9. RESULTS AND DISCUSSIONS

Instead of using High Speed Steel end mills, now the technicians are using carbide inserts and reduce the machining time by 4 times and again the technicians are giving minimum allowance for grinding operation. In this way the overall machining time. is reduced by 50% (previously the time had taken 32 minutes and now it is taking only 16 minutes)

It is achieved by formation of quality circle in the machine shop which analyzes the problems by quality circle team and upgradation training was given to the technicians those who are handling the work order regarding cutting speed parameters and the material properties

## 10. CONCLUSIONS

In this case, the quality circle process is used as an effective tool to find the quality related problems in the machine shop. Development of quality circle in the m/c shop of tool room has identified the problem related to the machine shop and reduced the processing time of selected Work Order PT0010-15. The other quality issues like rough milling and the allowance for grinding operation has been solved by the quality circle of the machine shop of tool room , Indore

Overall QCs develop positive attitudes among employees , develop leadership qualities ,feel job satisfaction, extend their support / effort to their organization and feel proud that employee of the organization in overall processes

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