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PG DEPARTMENT OF COMMERCE

SUBJECT NAME: TOTAL QUALITY MANAGEMENT

SUBJECT CODE: KDAXA

SEMESTER: II

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Extra-Disciplinary Paper I - Total Quality Management

Objective: To provide expert knowledge in the emerging Total Management techniques and to build conceptual clarity and skill of concept applications

UNIT I Introduction to Quality Control - Quality and Cost Considerations - Statistics and its Applications in Quality Control

UNIT II Sampling Inspection in Engineering Manufacture- Statistical Quality Control by the Use of Control Charts- Methods of Inspection and Quality Appraisal - Reliability Engineering - Value Engineering and Value Analysis

UNIT III Theory of Sampling Inspection - Standard Tolerancing - ABC Analysis - Defect Diagnosis and Prevention

UNIT IV Quality Improvement: Recent Technique for Quality Improvement - Zero Defect - Quality Motivation Techniques - Quality Management System and Total Quality Control

UNIT V Selection of ISO Model ad Implementation of ISO 9000 - Human Resource Development and Quality Circles - Environmental Management System and Total Quality Control

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TOTAL QUALITY MANAGEMENT

UNIT 1:

- ***INTRODUCTION TO QUALITY CONTROL***: 1)Focuses on the processes/ improvement plans. 2)Challenging quantified goods and benchmarking.3)Line management ownership 4)Specific incorporation in strategic planning.5)Meeting customers requirements. 6)Just in time/ demand flow manufacturing.7)Improvement teams 8)Symptoms to facilitate improvement. 9)Commitment by senior management and all employees10)Reducing product and service cost.
- ***QUALITY AND COST CONSIDERATION***:

1)Cost of conformance

- Cost of prevention
- Cost of appraisal 2)Cost of non-conformance
- Failure cost
- Exceeding requirement cost3)Basic operational cost

4)PAF (Prevention Appraisal Failure) cost

- ***STATISTICS AND ITS APPLICATION IN QUALITY CONTROL:***

1)Check sheets 2)Process flow diagram3)Pareto charts 4)Cause and effects diagram5)Scatter diagram 6)Histograms 7)Control charts

UNIT:2

- ***SAMPLING INSPECTION IN ENGINEERING MANUFACTURING***:

1) A study that helps the researcher to develop a pre-defined level ofcertainty.

2) Random sampling 3)Statistical sampling plans

4) Situation 1: You buy a batch of products and you want to use themost common sampling plan

5) Situation 2: You are a manufacturing organization and you want tofollow good practices

  - Incoming
  - In- process
  - Final

6) Situation 3: You want to implement an 'Acceptance on zero'sampling plan

7) A few other types of sampling plans:

  - Attributes: Non- defective, defective
  - Variables
  - Rectifying

- ***STATISTICAL QUALITY CONTROL BY THE USE OF CONTROL CHARTS:***

1) The control chart is a graph used to study how a process changesover time. Data are plotted in time order.

2) A control chart always has a central line for the average, an upper line for the upper control limit, and a lower line for the lower controllimit.

3) These lines are determined from historical data.

4) By comparing current data to these lines, you can draw conclusionsabout whether the process variation is consistent (in control) or is unpredictable (out of control, affected by special causes of variation).

4) This versatile data collection and analysis tool can be used by a variety of industries and is considered one of the seven basic qualitytools.

5) Control charts for variable data are used in pairs.

6) The chart monitors the average, or the centering of thedistribution of data from the process.

7) Control charts for attribute data are used singly.

- When to use a control chart
- Basic procedure
- Create a control chart
- Control chart resources

- ***METHODS OF INSPECTION AND QUALITY APPRISAL RELIABILITY ENGINEERING:***
  - Pre-production Inspection: Since quality issues are often a result of defects in the materials, inspections during the pre-production phase allow auditors to address any issues beforeproduction begins.
  - In-line Inspection:

  In-line inspections are important, as quality issues are often re- workable during the production phase and can be fixed before thefinal product is complete.

- Final Inspection:

  The final inspection is the last opportunity for auditors to catch and address quality issues before they end up in the hands of thebuyer, or even worse, the consumer.

- ***VALUE ENGINEERING AND VALUE ANALYSIS***:

  1) Exhaustive accumulation of information and identification andimprovement of assumptions.

  2) Creative mental activity, in which all judgement is temporarily deferred to form the roots of a variety of different solutions to each of the specific problems developed in the preceding analysis.3)During the information phase, the project and its requirements are analyzed, and then the function analysis studies the possible room for improvement.

  4) In the creative stage ideas to increase performances are developed from the resulting list of ideas only a short set is evaluated in order to find the ones with best potential to reachthe goal.

  5) VA/VE tools are extremely powerful and fundamental to reachobjectives such as decreasing costs, improving quality and shortening time-to-market.

UNIT:3

- ***THEORY OF SAMPLING INSPECTION***:

1) Sampling is a process of evaluating a portion of production/material from the whole lot

2) With this type of sampling a predetermined number of units fromcash lot is inspected.

3) A bad lot may be accepted because the sample drown from the lotwas good. A good lot may be rejected because the sample drown from the lot was bad.

4) When the cost of 100% inspection is huge in relation to the cost ofpassing a defective team.

5) A manual inspection, fatigue and boredom cause a higher percentage of defective material to be passed than would occure onaverage using a sampling plan.

6) A sampling plan can be specified by three parameters (i) lot size (ii)sample size (iii) acceptance number.

7) The random numbers tell which of the number pieces are to besampled and inspected.

- ***ABC ANALYSIS:***

1) ABC (Always Better Control)

2) Significance of spares

3)Issue from stores

4) The inventory value of items stored

5) Seasonality. This applies especially to the seasonal commodities.

6) Issues from stores (Frequency of consumption)

7) Sources from which material is obtained.

8) Purchasing problem with regard to availability.

9)By the priority and critical nature of the components or materialwith respect to production.

10) Decide cut of points and methods of control.

- ***DEFECT DIAGNOSIS AND PREVENTION***:

1)Defect diagnosis involves the analysis of a company/ establishmentto understand causes of failure or reduction in performance to enable formulation of appropriate repair measures.

2)Defect prevention is a strategy applied to the software development life cycle that identifies root causes of defect andprevents them from recurring.

3) The role of testers with the right level of experience is very crucial at this point, they need to be involved in defect prevention activities to ensure smooth functioning of other tasks.

4)Defect Pareto Chart: This chart reflects the frequency of occurrence of various categories of problems. The defects that has ahigher frequency of occurrence is observed and priority is assigned.

5)Root Cause Analysis: This is the method of finding the reason that contributes to the defect. It is an essential part in the elimination ofcauses that leads to the defects.

6)The coordinator is responsible for facilitating communication among the team members, planning and devising defect preventionguidelines etc.

7) Requirement specifications form the integral part of a softwaredevelopment life cycle

8) Whether it's the testing team that conducts the review process orthe end-user, it is an effective way to scan a defect.

9)Complete description of the defect to develop a better understanding of it, taking preventive measures so that the defectisn't carried forward to the next phases.

10) Identifying the root cause of the problem involves enhancedquality of the software application being developed.

UNIT:4

- ***QUALITY IMPROVEMENT***:

1) Customer focus

2) Total employee commitment3)Process approach 4)Integrated system
5)Strategic and systematic approach6)Continual improvement

7) Fact-based decision-making

8) Communications

- ***RECENT TECHNIQUES FOR QUALITY IMPROVEMENT***:

1)Clinical audit
2)Plan do study act 3)Model for improvement4)Lean/Six sigma

5) Performance benchmarking

6) Healthcare failure modes and effects analysis7)Process mapping
8)Statistical process control9)Root cause analysis 10)Communication tools

11) Technological innovations
12)Decision trees

- ***ZERO DEFECT***:

CONCEPT:

1) *Zero breakdown*: this implies a very high degree of reliability combined with very good maintenance capacity. As such, both manufacturer and maintenance personnel should associate andaim for zero breakdown
2) *Zero fault*: this actually means that fault should not be allowed tooccur but that should be detected much earlier and corrected and initial stage.
3) *Zero delay*: this calls for high level availability and essential maintenance jobs are planned and scheduled along with available shutdowns. The actual delay is almost nil so separateshut downs are generally takenexclusively for maintenance

4) *Zero Stock*: This concept means spares and other materials areprocured in such a way that those are received only when actually needed for consumption.

5) *Zero paper work*: Maintenance engineers/ personnel's are generally poor in paper work and so zero parer work concept tries to eliminate the paper work for maintenance personnel orat least, reduce it to barest minimum.

- ***QUALITY MOTIVATION TECHNIQUES***:

1) Increase employee morale and job satisfaction.

2) Improve employee productivity.

3) Maintaining the stability of the company's employees.

4) Improve discipline employees.

5) Streamline the procurement employees.

6) Create an atmosphere and a good working relationship.

7) Increasing loyalty, creativity, and employee participation.

8) Increase the level of employee welfare.

9) Enhance employee sense of responsibility towards their duties.

10) Improving the efficiency of use of tools and raw materials.

- ***QUALITY MANAGEMENT SYSTEM AND QUALITY CONTROL:*** 1)Project Management is the art and science of managing projects.2)There is an emphasis on quality, cost, and time.

3) Quality is one of the factors of the "triple constraint" that governthe art of project management.

4) Quality is defined as the degree to which the project meets therequirements.

5) Consumers may focus on the specification quality of aproduct/service.

6) They would compare it to competitors in the marketplace.7)Quality control is also known as QC in short.

8) This is a process by which entities review the quality of all factorsinvolved in the production.

9) QC focuses on ensuring that a product meets the prescribedtechnical standard of quality.

10) It should also meet the customer's requirements.

11) It involves the physical checking of activities at each specifiedstage of production.

12) This covers cycles from receiving materials and manufacturing totesting, packing, and shipping.

13) So, quality control is product-oriented and focuses on defectidentification.

UNIT:5

- ***SELECTION OF ISO MODEL AND IMPLEMENTATION OF ISO QUO:***

1)Top management decision2)Gate meeting
3)Form a core team 4)Awareness program 5)Prepare plan
6)Documentation training
7)Formulate documents 8)Practice
9)Create internal audits 10)Carry out internal audit11)Take corrective actions12)Management review
13)Selection of registrar
14)Certification audit
15) Registration

- ***HUMAN RESOURCE DEVELOPMENT AND QUALITY CIRCLES:***

1) It essentially involves giving due recognition to the contribution ofemployees and deriving full benefit from their experiences, so as to achieve improved work planning, better product quality and higher employee morale, all of which leads to higher productivity & better human relations.

2) The concept of Quality circle was developed for improving productquality through greater involvement of workers in job planning.

3) It is concerned with activities through the employee which are prepared to share higher responsibilities more effectively and alsoenables them to improve there career prospects for higher

promotional avenues, thereby helping them to lead a better qualityof work life

4) Quality Circles are small groups of employees who voluntarily meettogether on a regular basis to identify, define, analyse and solve work related problems, leading to improvement in their total performance, and enrichment of their work life.

5) Usually, the members of a particular team (quality circle) shouldbe from the same work area or who do similar work so that the problems they select will be familiar to all of them. An ideal size ofquality circle is eight to ten members.

6) Quality circle was originally associated with Japanese managementand manufacturing techniques, hence the concept of QC in essentially Japanese.

7) It played a major role in development of Japan after the secondworld war.

8) QC in Japan was formalized in 1960 by K.Ishikawa

9) In 1982 the QC forum of India was formed in Secundrabad to create awareness and for imparting skills in implementing QC indifferent organizations.

10) It is actively involved in sharing experiences of Indianorganizations in this effort.

- ***ENVIRONMENT MANAGEMENT SYSTEM AND TOTAL QUALITY CONTROL:***

- Both ISO 9000 and ISO 14000 series standards make somecommon requirements:
  - Doing business as usual is “unacceptable.”
  - Doing business without a systematic management approach iseconomic doom.
  - Providing quality is key.
  - Protecting and nurturing the environment is the key.
  - Doing it right the first time is crucial.
  - Getting your act together is essential.
  - Listening to customers and other stakeholders is absolutelynecessary.
  - Respecting society is mandatory.

- The objectives of Total Quality Environmental Management areto:
  - reduce waste and improve continuously,
  - reduce resource depletion,
  - reduce or eliminate environmental pollution,
  - design products for minimal environmental impact inproduction, use and disposal,
  - control environmental impact of raw material sourcing,
  - control environmental impact of new developments,
  - promote environmental awareness among employees and
  - promote environmental awareness within the community.

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