

Transportation Quality

Additional Chapter

Road Map to Success

Chapter Objectives: Quality

- What is TQM and what are the basic items that make it work?
- What is SPC and what are the various tools used in SPC?
- What is benchmarking and how can a company use it?
- What are some of the types of measures that could be used for both SPC and benchmarking in a TQM process in transportation?

International Intermodal Quality


Specialty Areas

Definitions of Quality

- - internal, cost-based
 - conformance to production requirements
 - meeting specifications
 - zero defects
- - external, value-based
 - consistent conformance to customer requirements and expectations
 - customer satisfaction



Components of Quality

- - skills
 - cooperate, facilitate, empower
- - user defined goals and objectives
- Analytical skills
 - data management capabilities
- Quality process
 - plan - do - check - act



Transportation Quality Process



- Customer Value Analysis
 - ongoing process of learning what the customer wants and is willing to pay for
 - value is a judgment based on expectations of service vs. the cost of obtaining that service
 - value is difficult to quantify in monetary terms
 - methods of analysis
 - survey of preferences and desires
 - measurement of satisfaction - expectations vs. perceptions of actual performance
 - must develop systems and processes that create and enhance customer value

Transportation Quality Process

Statistical Process Control



- Diagrams
 - shows relationship between problem and its causes
 - brainstorming tool
 - suggests what data to collect
- bar graphs
 - rank factors in order of occurrence
 - first step towards improvement
 - create knowledge
 - promote unity

Transportation Quality Process

Statistical Process Control


- provide map
 - communicate how process works
 - help eliminate wasted effort and duplication
 - underutilized tool
- plot a variable's activity over time
 - show trends and shifts in data
- simple bar graph
 - measure frequency of occurrence
 - shows variation in the process





Transportation Quality Process

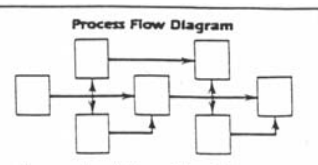
Statistical Process Control

- plot relationship between variables
 - must be paired samples that have some meaning
 - look for positive or negative trends
- moving picture of variation over time
 - run chart with control limits
 - provide early warning of unusual activity



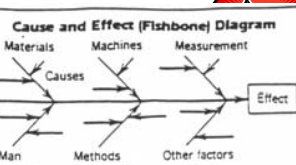


Process Flow Diagram



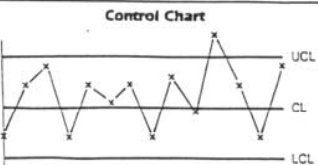
- Expresses detailed knowledge of the process
- Identifies process flow and interaction among the process steps
- Identifies potential control points

Cause and Effect (Fishbone) Diagram



- All contributing factors and their relationship are displayed
- Identifies problem areas where data can be collected and analyzed

Control Chart




- Helps reduce variability
- Monitors performance over time
- Allows process corrections to prevent rejections
- Trends and out-of-control conditions are immediately detected

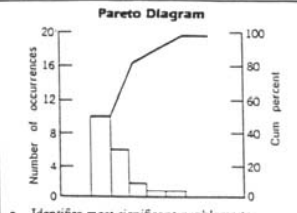
Checksheet

A							
B							
C							
D							
E							
F							

- Simplifies data collection and analysis
- Spots problem areas by frequency of location, type, or cause

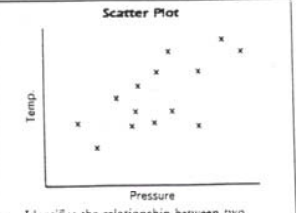


Pareto Diagram



- Identifies most significant problems to be worked first
- Historically 80% of the problems are due to 20% of the factors
- Shows the vital few

Scatter Plot

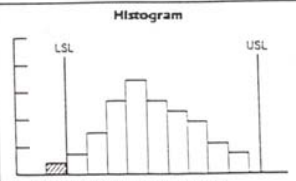


- Identifies the relationship between two variables
- A positive, negative, or no relationship can be easily detected


Design of Experiments (DOE)

- Useful in process development and troubleshooting
- Identifies magnitude and direction of important process variable effects
- Greatly reduces the number of runs required to perform an experiment
- Identifies interaction among process variables
- Useful in engineering design and development
- Focuses on optimizing process performance

Histogram




- The shape shows the nature of the distribution of the data
- The central tendency (average) and variability are easily seen
- Specification limits can be used to display the capability of the process



Transportation Quality Process

- a quality tool used in transportation to
 - identify best practices and performance
 - understand the processes used
 - determine if internal change is needed and how it should be modified
 - can focus on four groups
 - internal divisions
 - industry competitors
 - industry noncompetitors
 - world-class organizations



Transportation Quality Process

Five Step Benchmarking Process

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    Decide What to Benchmark
    ↓
    Plan the Benchmarking Process
    ↓
    Study Other Organizations
    ↓
    Learn From the Data
    ↓
    Use the Findings
    
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Transportation Quality Process

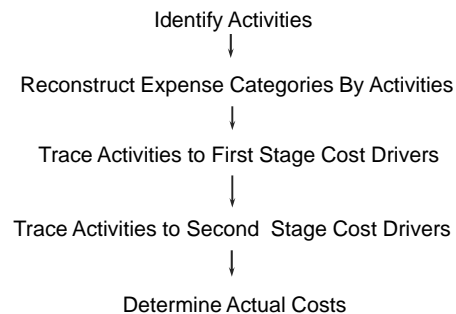
- Process
 - fundamental change or "reinvention" of the way a department, process, or function works
 - work from a clean sheet with as few barriers or limitations to change as possible
 - focus on new ways of doing business and innovation rather than copying a proven format
 - goal is dramatic improvement rather than incremental improvement
 - should be used in conjunction with other tools
 - risk-laden tool that should be used with caution

Transportation Quality Process

- Activity-Based Costing
 - a valuable tool for analyzing process costs
 - alternative approach to traditional cost allocation schemes (e.g. % of sales basis)
 - separates all costs (variable, fixed, etc.) and traces them toward specific cost drivers
 - allows management to accurately measure transaction costs or system change costs
 - exposes hidden costs and waste
 - gives greater control over performance
 - long run viability hinges on the ability to continuously improve cost-effectiveness

Transportation Quality Process

Five Step ABC Model



Strategies for Improving Transportation Quality


- Focus on value of service cost versus service levels provided
- Use purchasing involve multiple stakeholders
- Limit number of suppliers used reduce variation of service
- evaluate suppliers identify problems and eliminate root causes
- Pursue a process to achieve it develop

Dual Benefits of Improving Transportation Quality

- happy customers
- repeat business
- strong relationships
- consistent volume
- efficiency
- productivity
- cost control
- referrals
- profitability
- growth

- less service variance
 - on-time
 - damage
 - errors
- predictable service
- less inventory needed in system
- lower logistics costs
- competitive advantage

ACME Airlines!!!!






In/Out of Class Assignment

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