



Total

Quality

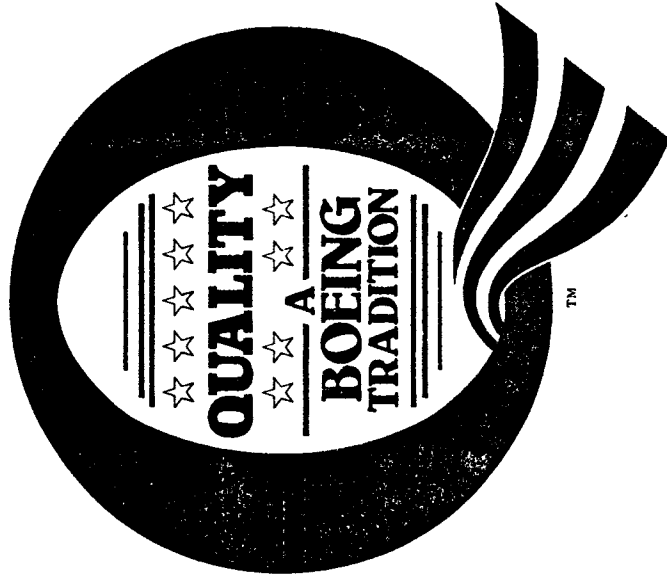
Concept



Total

Quality

Concept



*Bob Lowson
Quality Circle
1988*

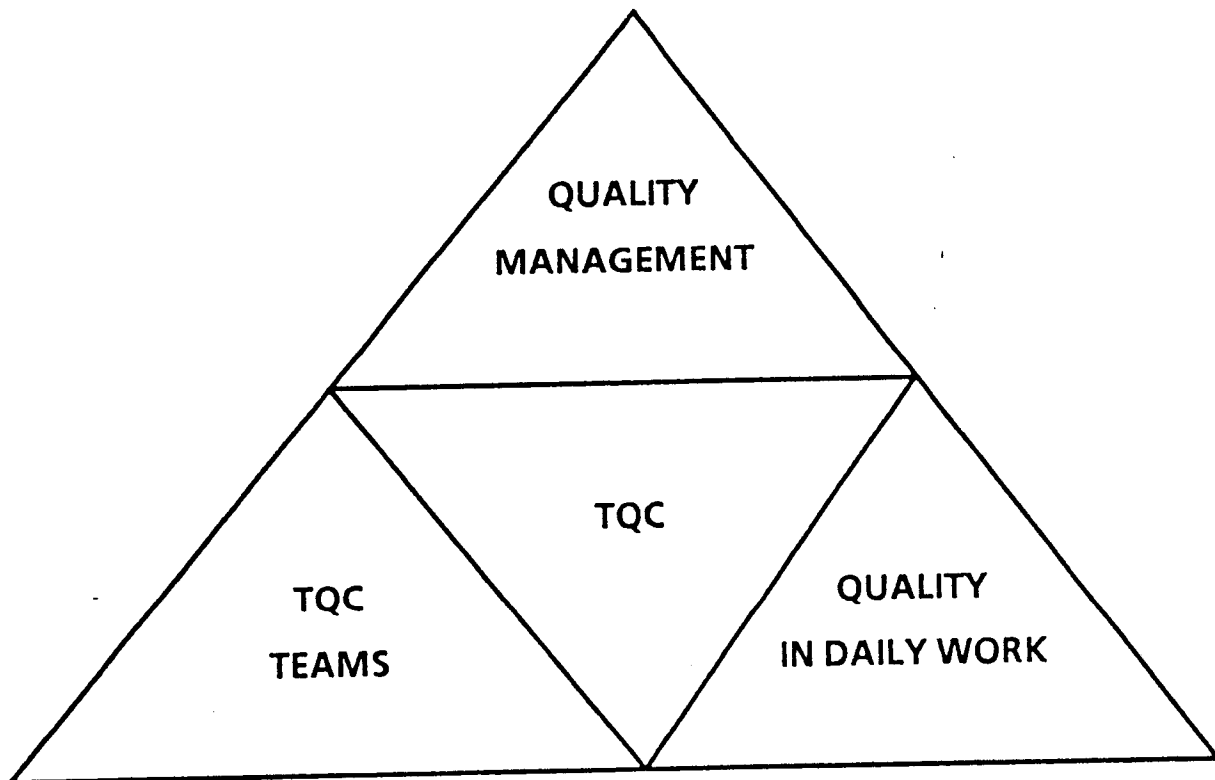


Operation Eagle

/

WHAT IS TOTAL QUALITY CONCEPT?

Our company has a goal: customer satisfaction through company-wide quality control. The Total Quality Concept is the process, by which we work toward that aim. The TQC Triangle gives us a graphic overview:



TQC TEAMS:

Provide a structured environment for employees to work together.

The goals are:

- To improve the quality of the products and services we provide.
- To develop the skills and abilities of all employees.
- To promote communication and team work.
- To enhance the quality of work life.

T.Q.C. is our future. It is the spirit which stands behind our company
Quality Commitment which reads:

*schedule
highest priority*

Quality is the highest priority of this company.

The quality and safety of our products must never be compromised.

It is management's responsibility to provide the safe working conditions, tools, training, and environment so that each employee can achieve goals of high quality, error-free performance.

It is every employee's responsibility to strive for high quality, error-free performance as a daily goal at BMAC.

The future success of BMAC depends on the quality of our products today.

A. M. S. Goo

A.M.S. Goo

Who is your customer?

The customer is the next user of your output

- Check your work
- Fix the defect in place, don't send the defect to the next customer

Everyone 4-C's

- Care
- Concentration
- Scientiousness
- Communicate

Manager 3-T's

- Provide
- Training
 - Tools
 - Tolerances

Walt's Ideas

Lead Engr

Training

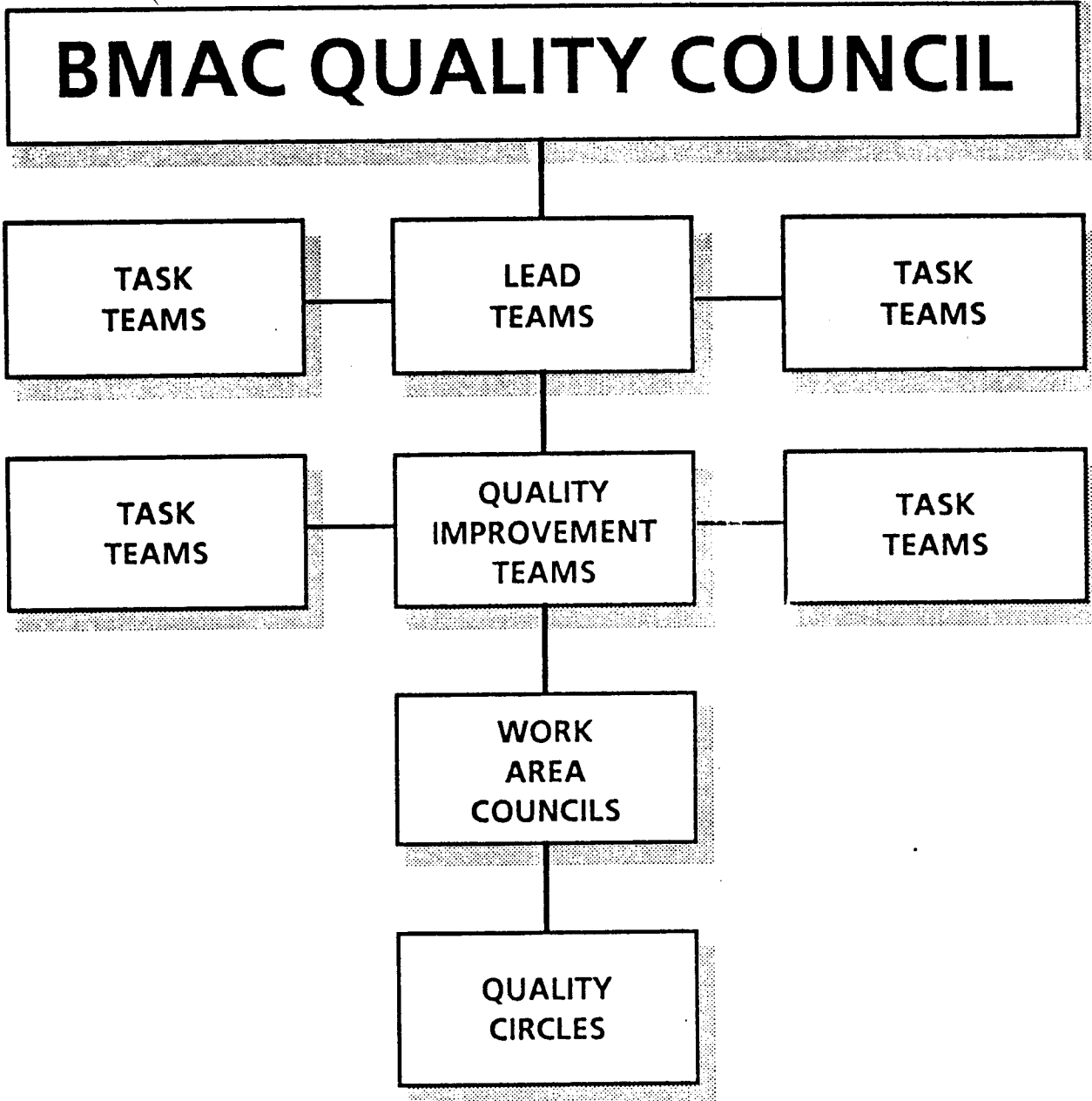
Methods

Objectives, accuracy

TAC 11/11/11
777 quality department
in 10 years. In 10 years, only
customers control only
No quality control in
schedule control in
10 yrs!

AMS 606
& 607 of 1977

Usual
Council
Flow



TYPES OF TQC TEAMS

BMAC QUALITY COUNCIL

The BMAC Quality Council is the coordination focal point for TQC. The Council will set policy and provide guidance to the TQC Director in the overseeing and monitoring of TQC implementation and maintenance for BMAC in addition to formulating the BMAC quality commitment. Membership consists of those people who report to the BMAC President.

LEAD TEAMS

There will be one Lead Team in each functional organization responsible for guiding TQC implementation within the respective organization. The Lead Team may assign projects to Quality Improvement Teams or TQC Task Teams. The Lead Team will be headed by the Director/Vice-President of the organization. Additional members are the Director's/Vice-President's Staff.

QUALITY IMPROVEMENT TEAMS (QIT)

Quality Improvement Teams (QITs) will work projects assigned by the organizational Lead Team, select other projects to work, or assign projects to TQC Task Teams. Each member of a Director's/Vice-President's Staff will lead a QIT. Additional members are the QIT leader's staff.

TQC TASK TEAMS

TQC Task Teams are special teams established for specific problem resolution. TQC Task Teams may be formed by Lead Teams or QITs. Membership can be either functional or cross-functional drawn from those with expertise in the particular problem area.

TYPES OF TQC TEAMS

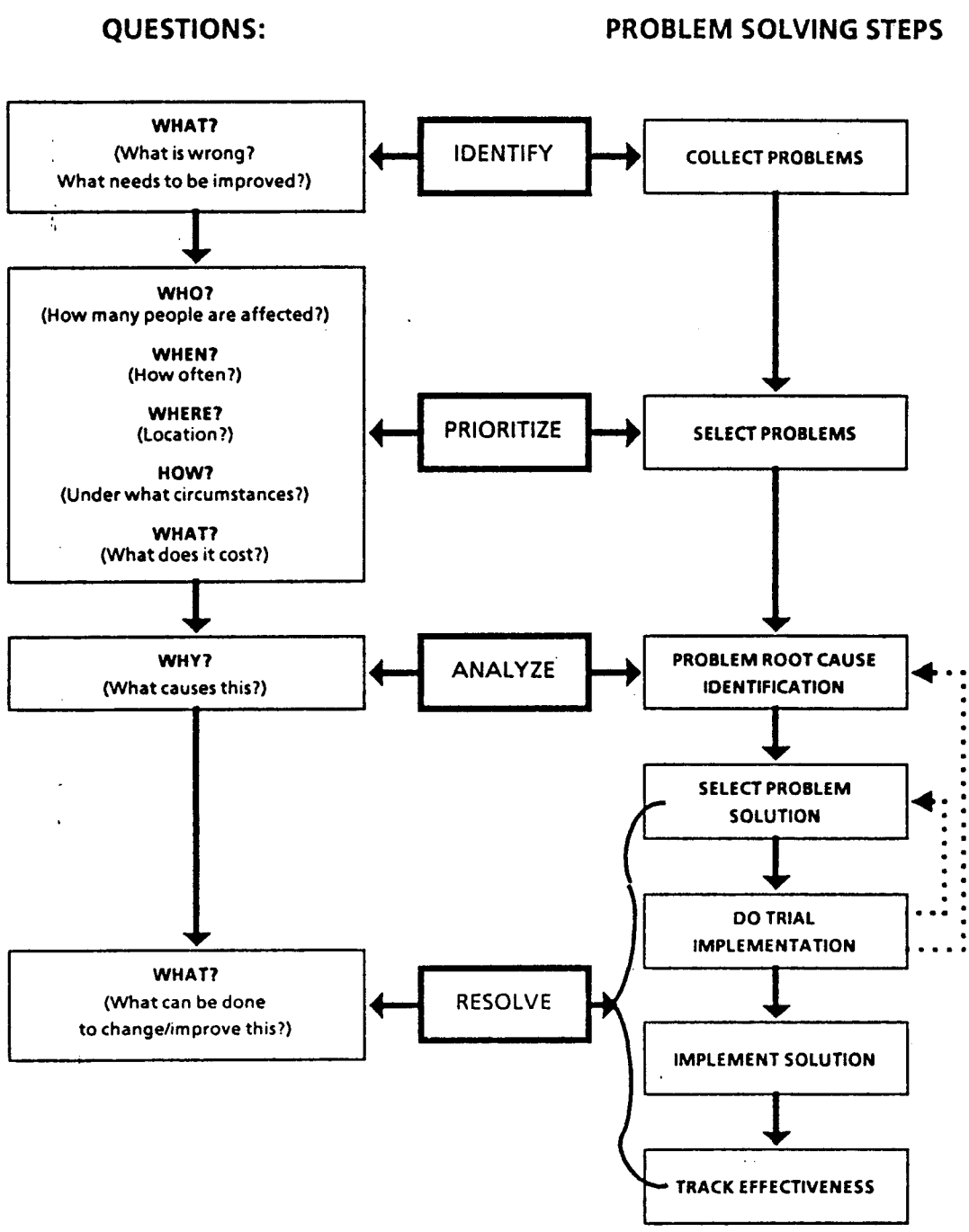
WORK AREA COUNCILS

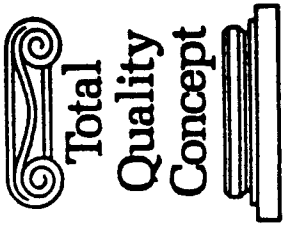
Work Area Councils meet monthly to review Quality Circle activity and foster improved Management-Circle communication and cooperation. Each Work Area Council is chaired by its respective second level manager. Membership includes Quality Circle Co-leaders and representatives from support organizations in the work area.

QUALITY CIRCLES

Quality Circles meet weekly to identify, analyze and solve work selected problems. Each Circle is led by two Co-leaders selected by the membership. At least one Co-leader may be a first-line supervisor. Circle membership is voluntary and is comprised of shop-floor workers from specific work areas.

Here is a representation of how these four stages correspond to the seven IMPROVEMENT OPPORTUNITY (problem-solving) steps.

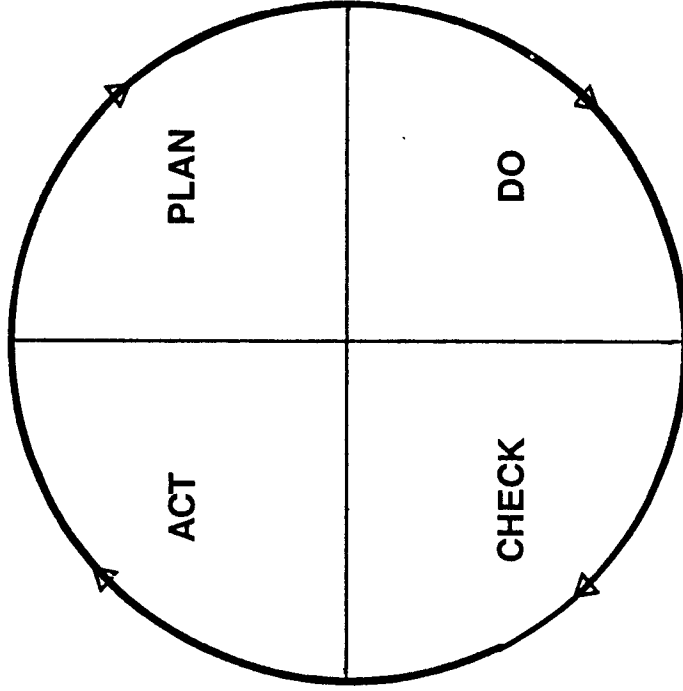




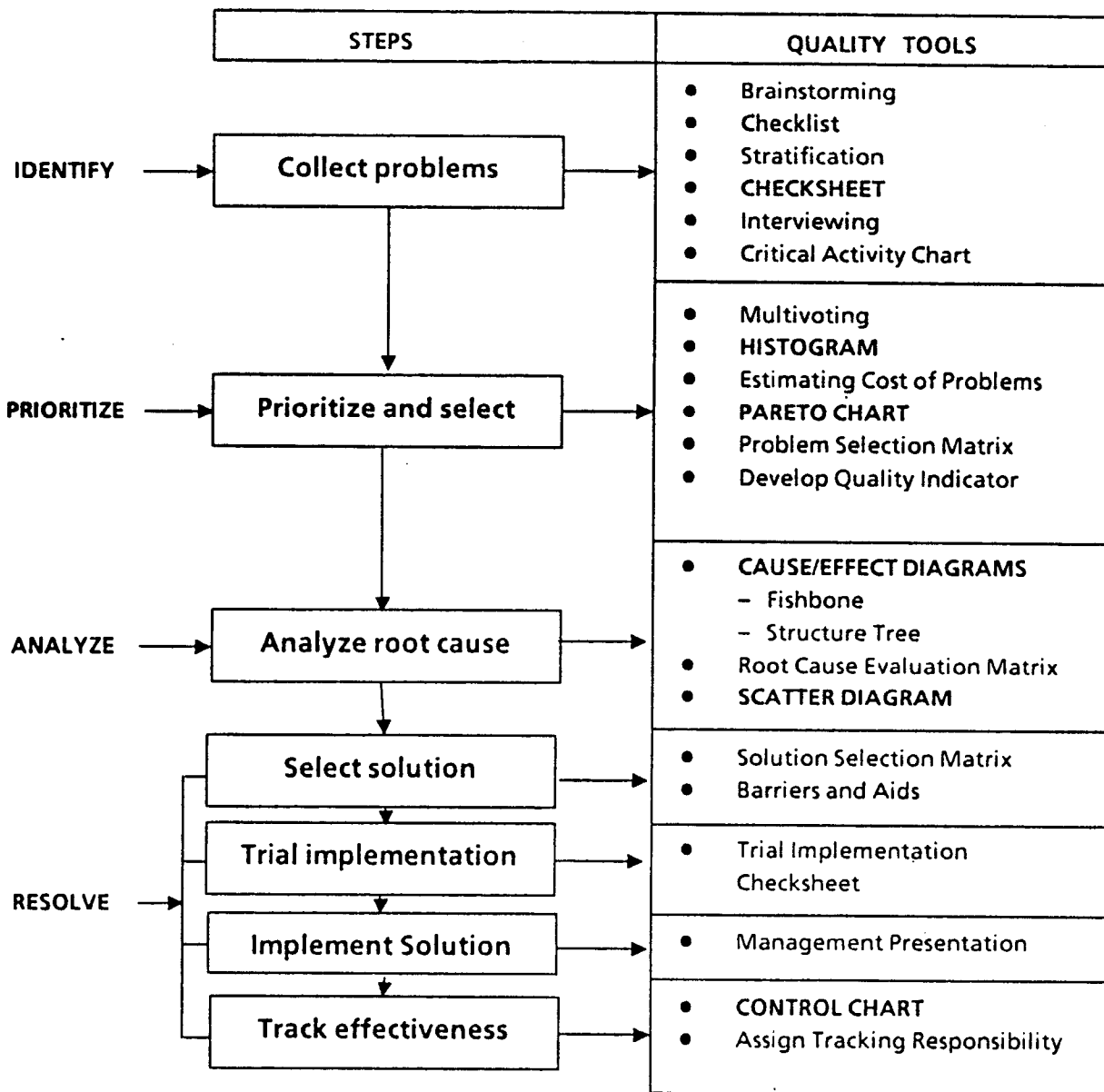
Total Quality Concept



Plan-Do-Check-Act Status



IMPROVEMENT OPPORTUNITY PROCESS



BRAINSTORMING

A. WHAT IS IT?

1. Brainstorming is a way of using a group of people to quickly **generate, clarify and evaluate** a sizable list of ideas, problems, issues, etc.
2. These three phases are like the gears on a car; you can only be in one gear at a time without injuring the mechanism.
2. The emphasis is on quantity of ideas, not quality.
3. It can be an excellent technique for tapping the creative thinking of a team.

B. WHY IS IT USEFUL?

Brainstorming helps to document "what we know" as a team. It stimulates team creativity, and gets everyone involved.

C. HOW IS IT DONE?

1. During the **generation phase** of Brainstorming, the leader reviews the Rules for Brainstorming with team members:
 - Clearly state purpose (e.g. what to improve in our work area)
 - Each person takes a turn, in sequence around the group
 - One thought at a time
 - Do not criticize nor discuss any idea
 - OK to pass
 - Build on ideas of others
 - Record ideas where visible for group
- a. The leader states the topic to be brainstormed in specific, precise terms, and makes it visible.
- b. A recorder is selected.
- c. The generation phase begins, and continues until all ideas have been exhausted.

STRATIFICATION

A. WHAT IS IT?

Stratification is the breaking down of the whole (total area of concern) into smaller related subgroups. For example: oranges into navel, temple and mandarin; material sources into vendor, batch, lots; Divisions into Eastern, Northeastern, Southern, Southeastern, Western.

B. WHY IS IT USEFUL?

Stratification allows for closer scrutiny and analysis of data, and provides maximum information from the data.

C. HOW IS IT DONE?

1. Review the whole to determine smaller, natural groups, made up of relatively similar units.
2. Collect data relative to those smaller groups, rather than the entire area of concern as a single entity.
3. Analyze data based on those smaller groups, as well as combining two or more together.
4. If analysis of the stratified data does not reveal a significant item, stratify in other ways or gather other data.

D. WHEN IS IT USED?

During data gathering:

- When creating a Checklist
- When designing a Checksheet
- When selecting a sample

During data analysis when using:

- Histograms,
- Pareto,
- Scatter Diagrams,
- Cause and Effect Diagrams

MULTIVOTING

A. WHAT IS IT?

Multivoting is a structured series of votes by a team, used to help teams reduce a list containing a large number of items to a manageable few (three to five).

B. WHY IS IT USEFUL?

Multivoting helps to accomplish "list reduction" quickly and with a high degree of group agreement. This technique tends to eliminate individuals' close identification with items.

C. HOW IS IT DONE?

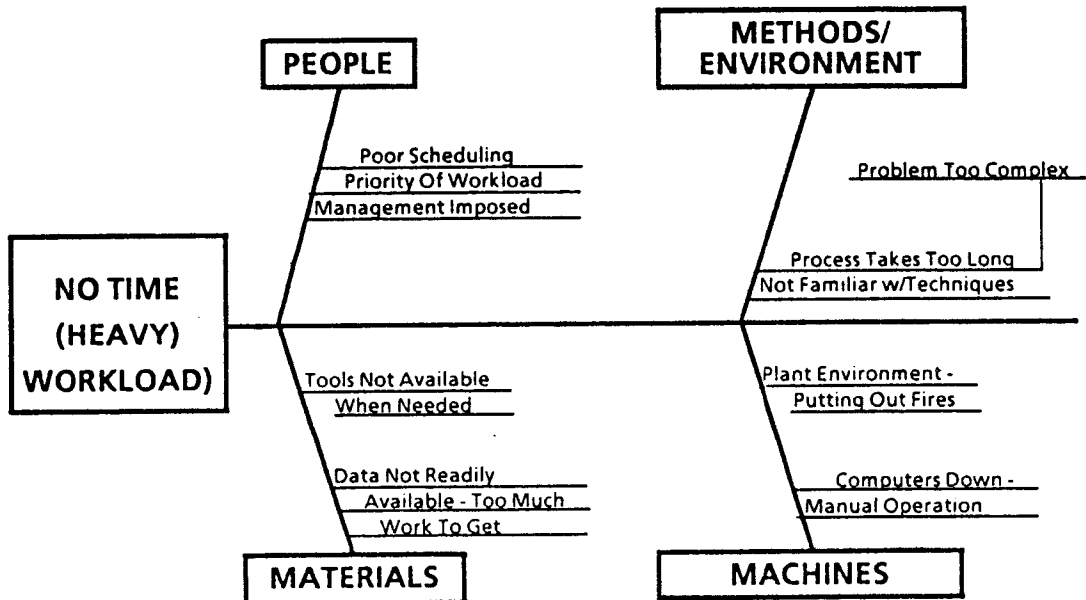
1. 1st vote - each person votes for as many items as desired, but only once per item. Circle the items receiving a relatively higher number of votes than the other items. (Example: A team has 10 members. Items receiving 5 or more votes are circled.)
2. Count the circled items. 2nd vote - each person gets to vote a number of times equal to one-half the circled items. (Example continued: If 6 items received 5 or more votes, then each person gets to vote 3 times during the 2nd vote.)
3. Continue multivoting until the list is reduced to three to five items, which can then be further analyzed. NEVER MULTIVOTE DOWN TO ONLY ONE (1) ITEM!

D. WHEN IS IT USED?

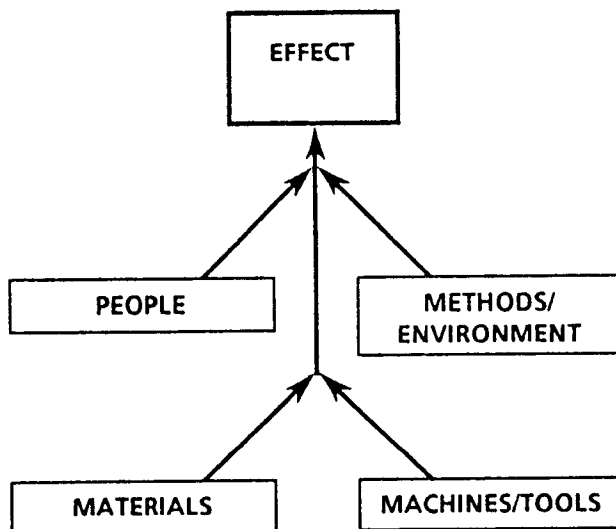
As a subjective prioritizing technique, after a team discusses the various items on a Brainstorm list, and the list is too lengthy to be addressed at once.

CAUSE-AND-EFFECT DIAGRAMS

Fishbone Diagram



Sometimes, for ease of use on a flipchart, it is better to draw the fishbone like this:



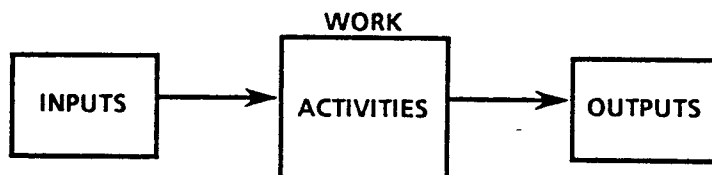
CRITICAL ACTIVITY CHART

WHAT IS IT?

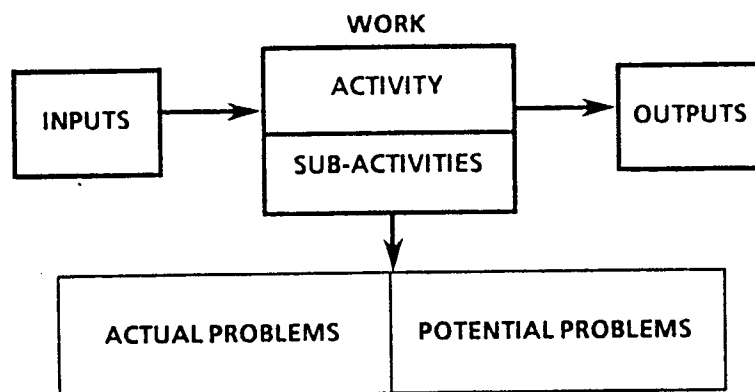
The Critical Activity Chart is a tool for analyzing and gathering information about sequential operations. Important inputs to and outputs from a major work are recorded on the chart. All the activities pertaining to it are listed. It may even be expanded to include present and potential problems.

WHAT DOES IT LOOK LIKE?

The basic format of a CAC is:

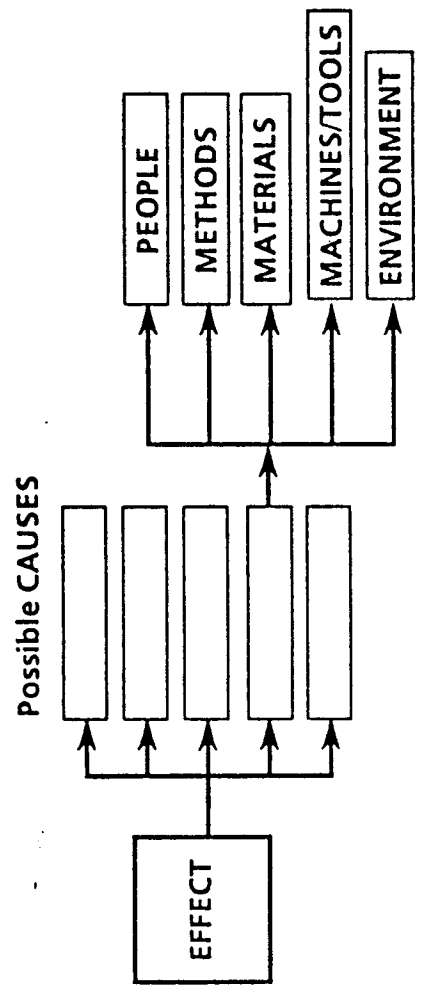


It can be expanded, depending on need, to look like this:



CAUSE-AND-EFFECT DIAGRAMS

Structure Tree Diagram



NOTE: Grow the tree into areas the team considers most likely to contain a root cause.

WHEN ARE THEY USED?

After a problem is selected and carefully defined, construct a Cause-and-Effect Diagram so the team can systematically analyze cause and effect relationships and identify the root cause of a problem.

MATRIX - ROOT CAUSE EVALUATION						
<u>Potential Root Cause</u>	<u>Root Cause or Symptom</u>	<u>Causes</u> ____ % of <u>Problem</u>	<u>Actionable</u> <u>Yes/No</u>	<u>How</u> <u>Verify</u>	<u>System</u> <u>Related</u> <u>Yes/No</u>	<u>Other</u>
#1						
#2						
#3						
#4						

COCO: 4 PRINCIPLES OF PROBLEM-SOLVING

A. WHAT ARE THEY?

COCO stands for:

- Clarity in defining the improvement opportunity or problem.
- Objectivity in the data used to make decisions.
- Commitment from those affected by the problem and solution.
- Ownership of the entire process by the TQC team.

B. WHY DO WE USE THEM?

We use them as standards for quality performance. COCO can keep us from getting bogged down and keep us on track for effective improvement activities

C. HOW DO WE APPLY THEM?

CLARITY: Have we defined the issue, the problem or the opportunity so that everyone understands it?

OBJECTIVITY: Have we used data in such a way as to substantiate our claims and overcome our personal biases and shortsightedness? Speak with facts.

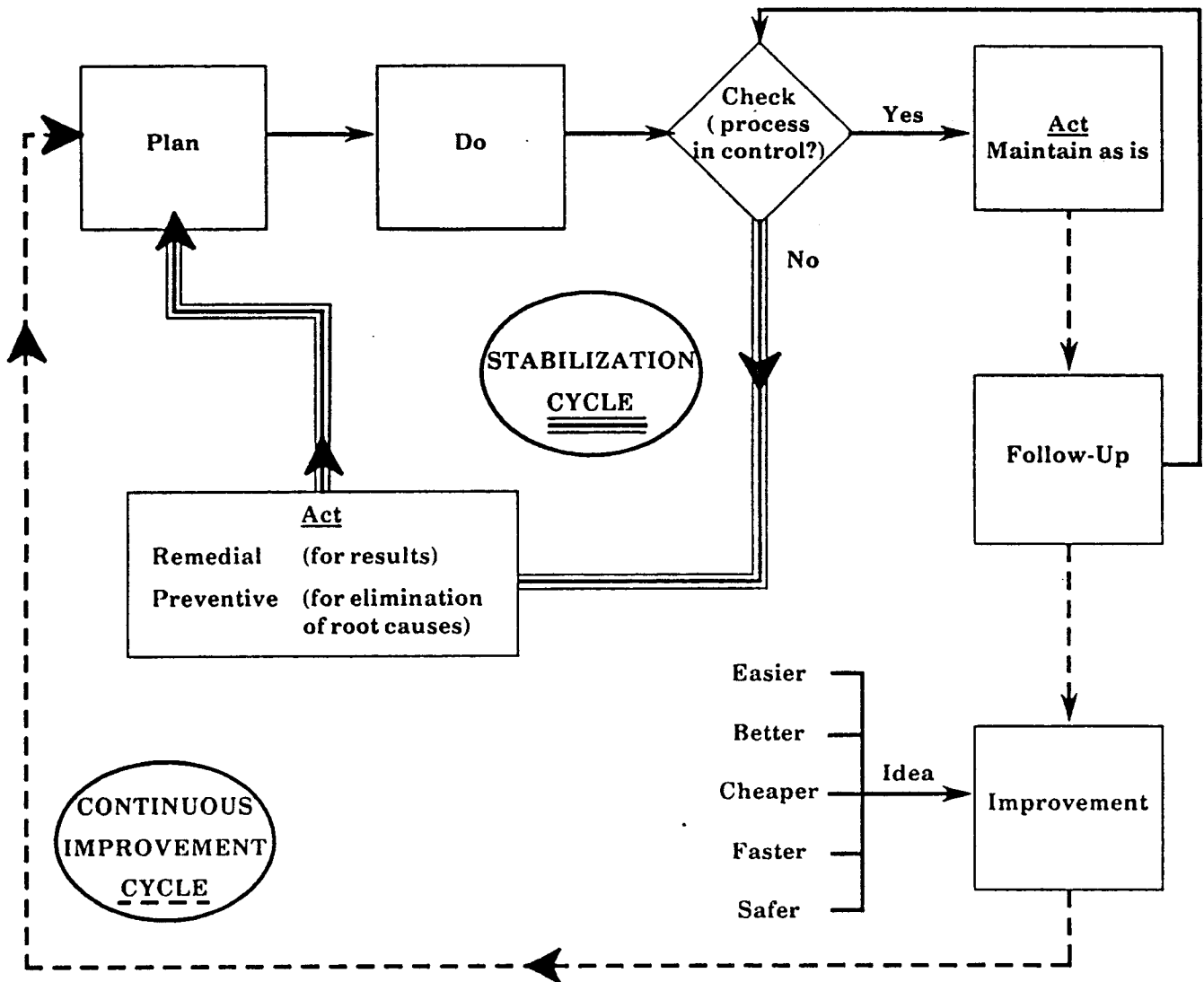
COMMITMENT: Have we established an atmosphere of trust and interest by keeping others informed and involved in our process?

OWNERSHIP: Has the team retained both authority and responsibility for the area it has chosen or has been assigned?

D. WHEN CAN WE USE THEM?

We can use them at any point to help us gauge the degree to which our teams are really following the Quality Improvement process. We can also use them in everyday work as we are constantly trying to improve what we do and how we do it.

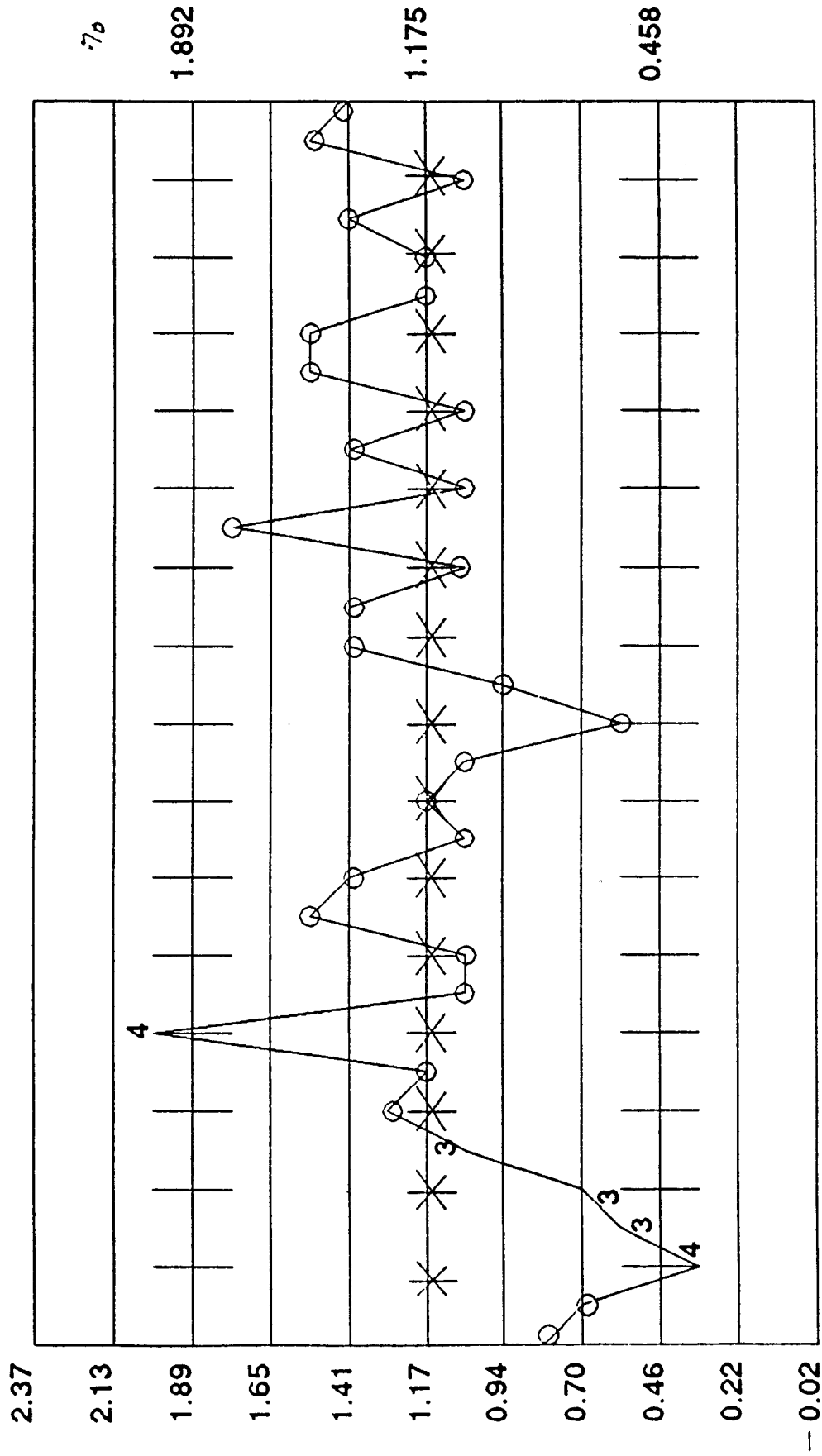
QUALITY IMPROVEMENT DIAGRAM



In both loops we plan to satisfy the needs of the user (establish valid requirements), do the work, and check whether the work conforms to valid requirements. In the stabilization phase we close the loop when we act to remedy and prevent problems, if the output doesn't conform to valid requirements.

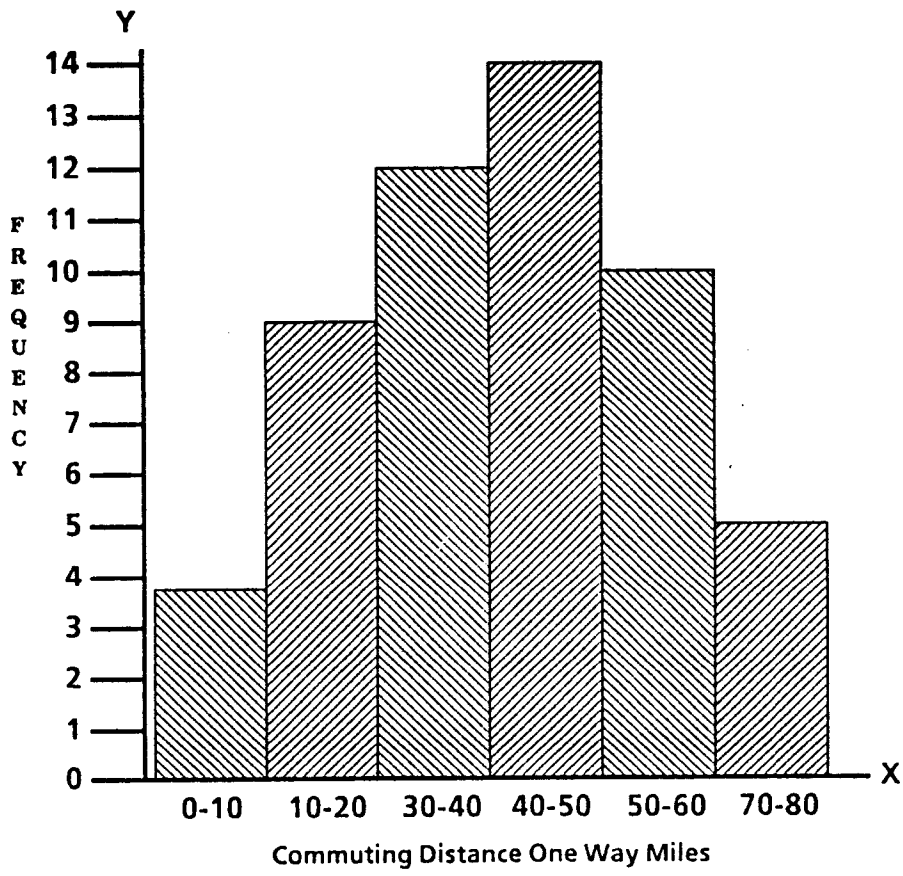
ERROR RATES

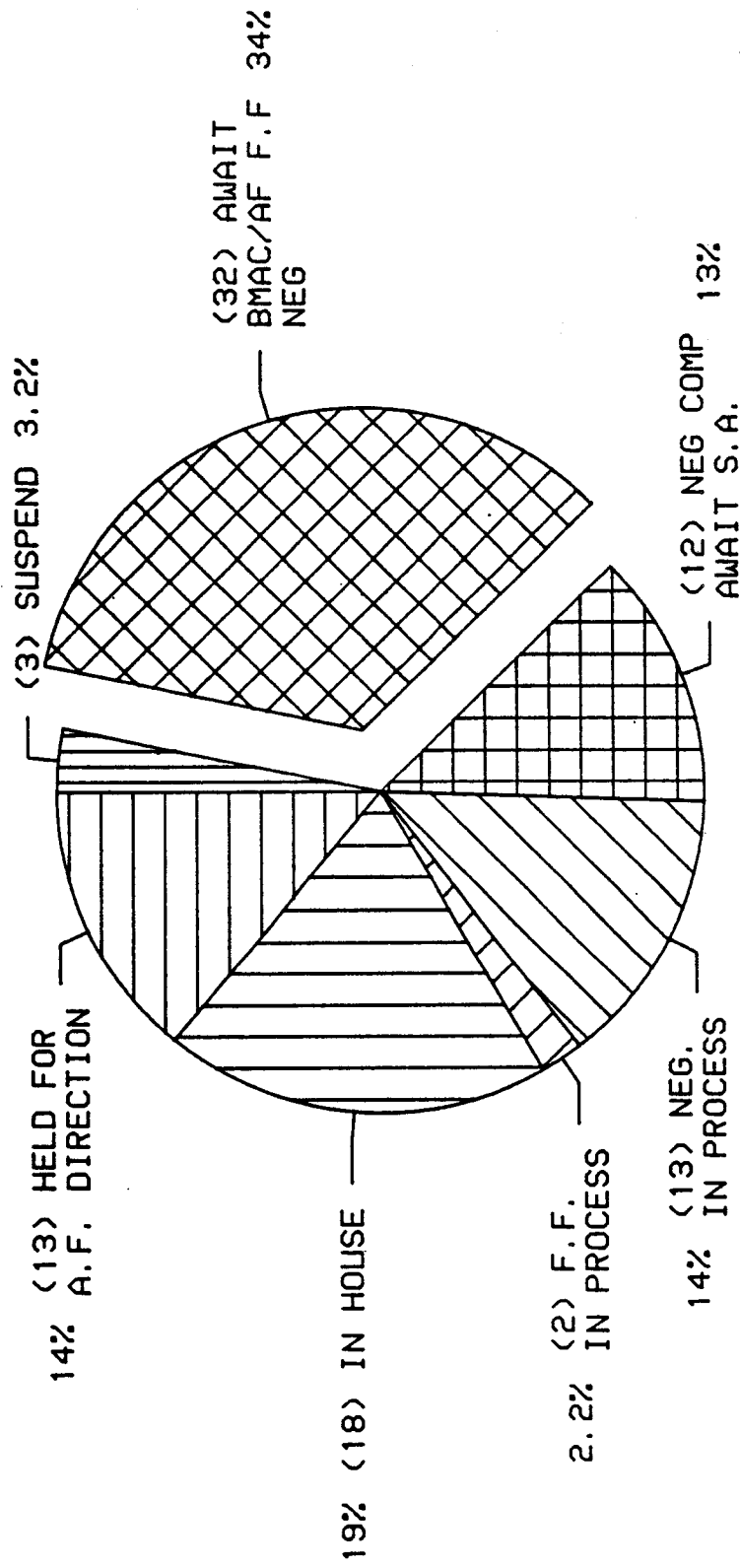
JULY 1983 TO DECEMBER 1986



- 1 8 IN A ROW (1) SIDE OF AVG
 - 2 4 OUT OF 5 SPCL SD OF 1
 - 3 2 OUT OF 3 2*SPCL SD OF 2
 - 4 3*SPCL (1) SD OF 2 3
- *-*-*- X AVG. MR AVG.
 - +--+ + CONTROL LIMITS
 - -- POINT OFF PLOT

HISTOGRAMS



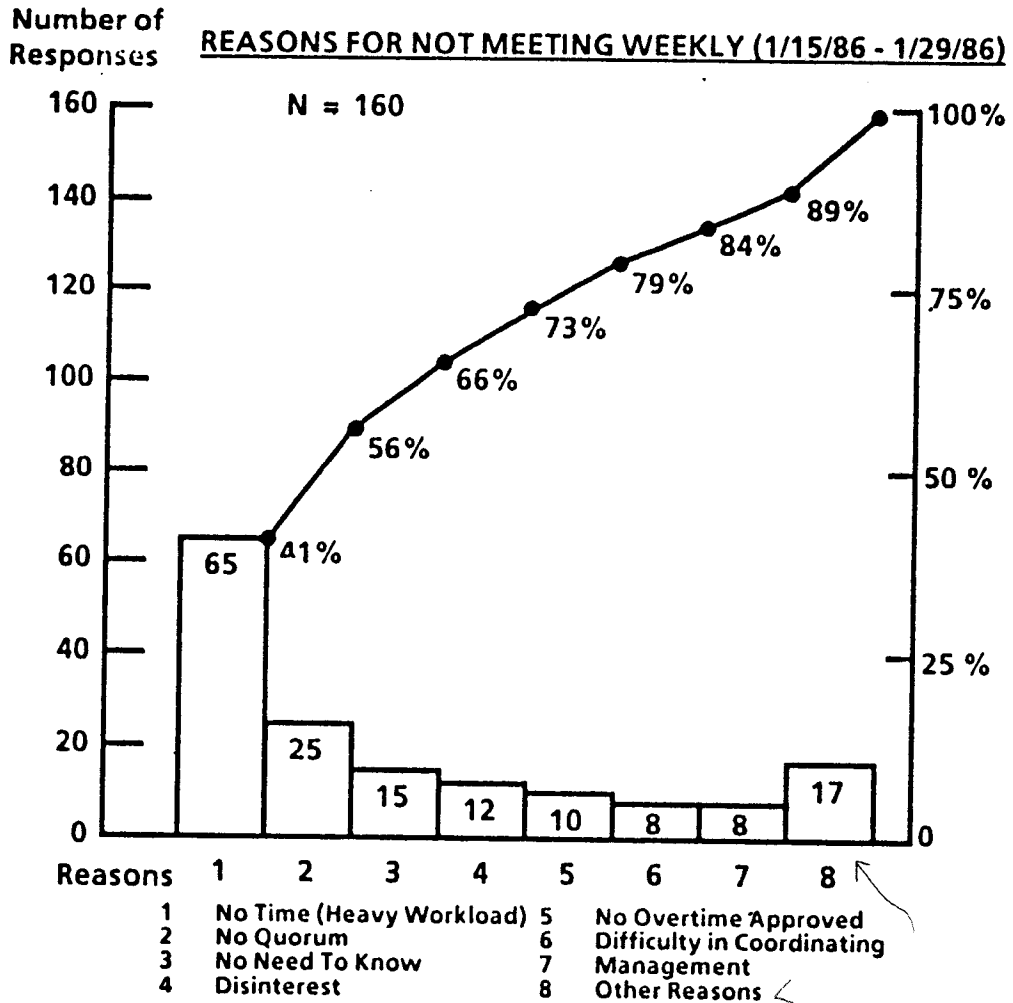


(93 PROPOSALS)

PARETO CHART

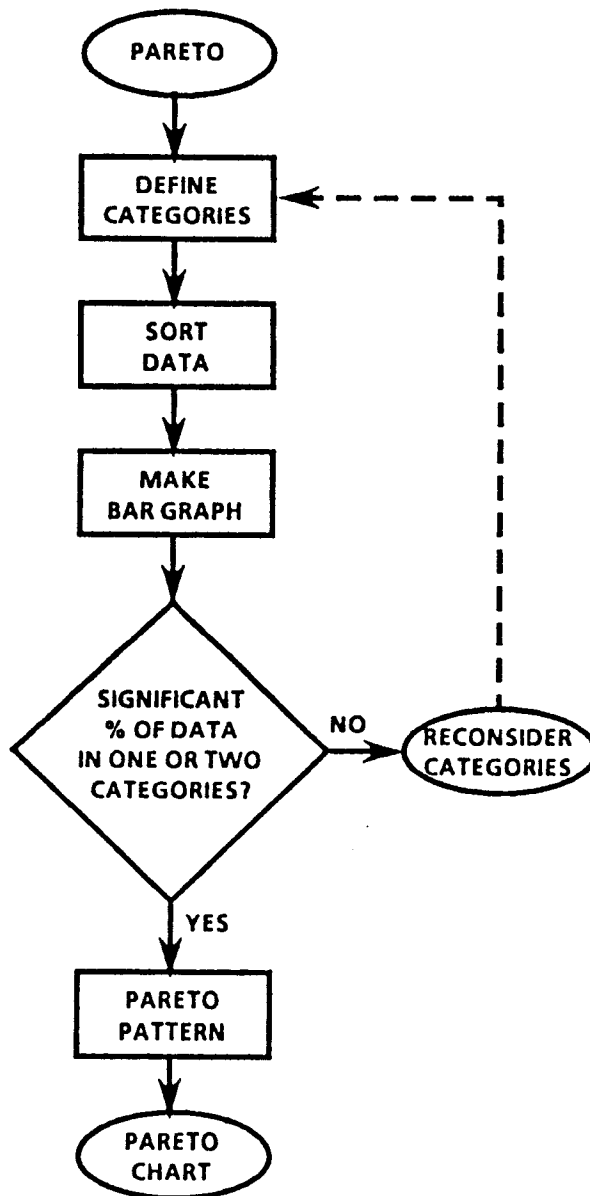
WHY IS IT USED?

Arranging data on a Pareto Chart may suggest something of importance that would otherwise have gone unnoticed. Selecting categories, tabulating data, ordering data and constructing the Pareto Chart can enhance communication among team members and with management. The chart helps to highlight "the vital few" in contrast to "the trivial many."



PARETO CHART

FLOWCHART: PARETO ANALYSIS



MATRIX-PROBLEM SELECTION

PROBLEM	FITS DEPARTMTL OBJECTIVES	CAN OUR TEAM ANALYZE?	TRIED TO SOLVE BEFORE?	IS IT MEASURABLE?			
				EST. \$ LOSSES	% OF TOTAL PROBLEMS	#'S OF PEOPLE AFFECTED	OTHER
1.							
2.							
3.							
4.							

