

SOLUTIONS MANUAL


Eighth Edition

Quality Control



Dale
Besterfield



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Online Instructor's Manual
to accompany

Quality Control

Eighth Edition

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PREFACE

This manual has been published to simplify the instructor's tasks of developing learning activities and evaluating performance. It is based on the experience of the author and is meant to serve as a guide. Each instructor will need to modify this information for the particular course objectives and the ability level of the students.

For those teachers who are familiar with the *Seventh Edition* of the textbook, information on the major changes to the *Eighth Edition* is provided. This information should simplify the transition to the latest edition.

A typical course outline for a three-semester hour course is shown on Page 3. The learning activities are based on 45 class meetings of 50 minutes each. Since it is difficult to cover all of the material in a typical three-semester hour course, this outline concentrates on the quantifiable aspects of quality control. The instructor may wish to place greater emphasis on the first three chapters, which are non-quantifiable and build a transition to the statistical aspects of quality..

Solutions for the problems start on Page 4. The author has found it advantageous to post the solutions. This action allows students to determine if their methods and answer are correct.

Typical multiple-choice test questions are given and an asterisk indicates the correct answer. These questions can be modified in a number of ways depending on the creativity of the instructor. Answers to test problems are also given. Since the tables in the body of the text and in the Appendix are needed to solve the problems, an open-book type examination should be considered. The instructor may also consider providing copies of the tables and using a closed-book format. Regardless, the multiple-choice questions can be given in the closed-book format. The author has found that allowing the students 3x5 cards for formulas and other information is a great learning experience.

Major Changes to the Eighth Edition

General

1. Problems to exercises.
2. Objectives added to each chapter.
3. Where appropriated changed product to product or service.
4. Where appropriated changed company to organization
5. Footnotes are provided for more advanced topics.
6. Changed exercise notation to include the chapter such as 1-1, ..., 1-6; 2-1, ..., 2-8, etc.

Chapter 1

1. Added ASQ definition of quality.
2. Changed slide projector to plasma TV in Table 1-1.
3. Modified Figure 1-1.
4. Added exercises.

Chapter 2

1. Added Lean to Figure 2-1 along with other modifications.
2. Added time line to annual quality improvement program.
3. Added that performance measures should not be used as a “whip.”
4. Clarified Figure 2-7 with a footnote.
5. Revised Figure 2-8 and Table 2-4

Chapter 3

1. Moved scatter diagram to Chapter 4

Chapter 4

1. Changed weekly wage numbers for example on range
2. Added coefficient of variation to other measures
3. Added least squares calculations to scatter diagram.

Chapter 5

1. Added additional statistical information to six sigma.
2. Added exponential moving average chart with exercises.
3. Added ARL

Chapter 6

1. Added footnotes as links to recent literature on T^2 multivariate chart and deviation chart.

Chapter 7

1. Added mean and standard deviation formulas to hypergeometric, binomial, and Poisson distributions.
2. Added exercises 17 and 18 and renumbered the rest.
3. Eliminated examples and exercises concerning approximation techniques because they are obsolete.

Chapter 8

1. Added information on sample size and confidence limits.

Chapter 9

1. Changed meaning of AQL

Chapter 10

1. Latest standards revision.

Chapter 11

1. Added a section on test design with footnotes to advanced material.

Chapter 12

1. Added footnotes to information on use of these techniques for innovative design.

TYPICAL COURSE OUTLINE

<u>Meeting</u>	<u>Topic</u>	<u>Chapter</u>
1	Introduction to Quality	1
2 and 3	TQM - Principle practices	2
4	TQM - Tools & Techniques	3
5 thru 9	Fundamentals of Statistics	4
10 thru 15	Control Charts for Variables	5
16	Examination I	
17 and 18	Additional SPC Techniques for Variables	6
19 thru 23	Fundamentals of Probability	7
24 thru 28	Control Charts for Attributes	8
29	Examination II	
30 thru 39	Lot-by-Lot Acceptance Sampling by Attributes	9
40 thru 43	Acceptance Sampling Plan Systems	10
44	Reliability (non quantitative)	11
45	Examination III	

Chapter 3. TQM—TOOLS AND TECHNIQUES

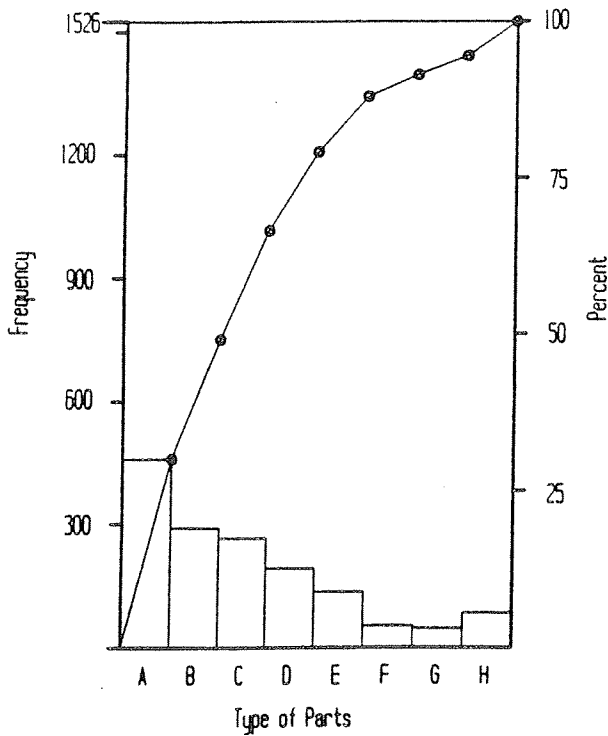
1. Replacement Parts: (6-month period)

	<u>Frequency</u>	<u>Percent</u>	<u>Cumulative Frequency</u>	<u>Cumulative Percent</u>
A. front burners	460	.30	460	.30
B. rear burners	290	.19	750	.49
C. oven regulators	265	.17	1015	.66
D. oven door	193	.13	1208	.79
E. burner control	135	.09	1343	.88
F. timer	53	.03	1396	.91
G. drawer rollers	46	.03	1442	.94
H. All others	84	.06	1526	1.00
	1526	1.00		

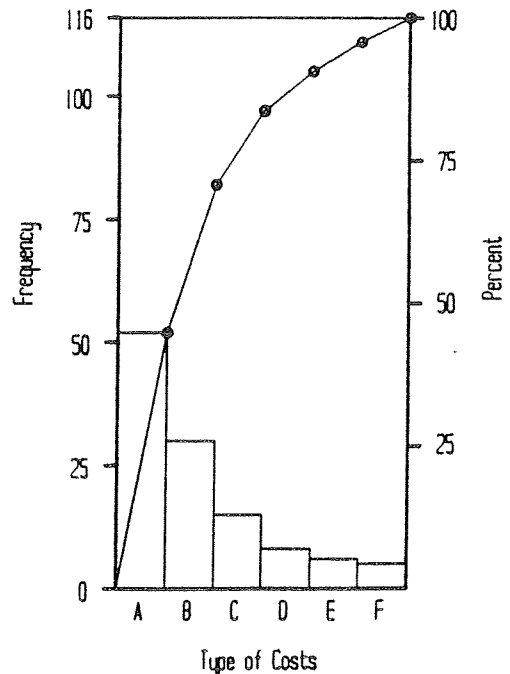
2. Downtime Costs: (3-month period) in thousands of dollars

	<u>Frequency</u>	<u>Percent</u>	<u>Cumulative Frequency</u>	<u>Cumulative Percent</u>
A. lost cooling	52	.45	52	.45
B. back pressure reg.	30	.26	82	.71
C. adjust feed worm	15	.13	97	.84
D. valve replacement	8	.07	105	.91
E. jam copperhead	6	.05	111	.96
F. All others	5	.04	116	1.00
	116	1.00		

(1)



(2)

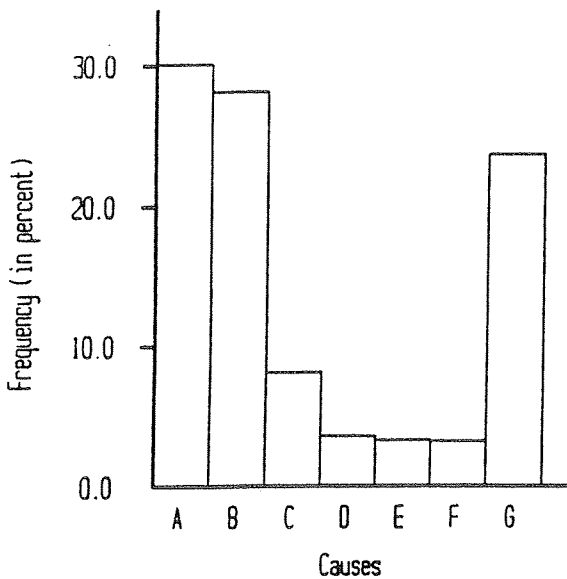


3	Cause of accident	in percent
	a. right-of-way violation	30.1
	b. driving too fast for condition	28.1
	c. following too closely	8.1
	d. improper turn	3.6
	e. driving left of center	3.3
	f. improper overtaking	3.2
	g. all other	<u>23.6</u>
		100.0

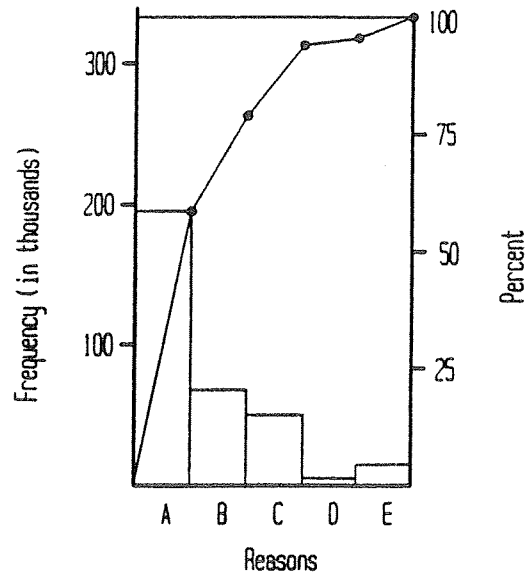
4. Reason for Shipment Return: (quarter)
in thousands

	<u>Frequency</u>	<u>Percent</u>	<u>Cumulative Frequency</u>	<u>Cumulative Percent</u>
A. refused	195	.585	195	.59
B. wrong address	68	.20	263	.79
C. wrong selection	50	.15	313	.94
D. order canceled	5	.02	318	.96
E. All other	<u>15</u>	<u>.045</u>	333	1.00
	333	1.00		

(3)

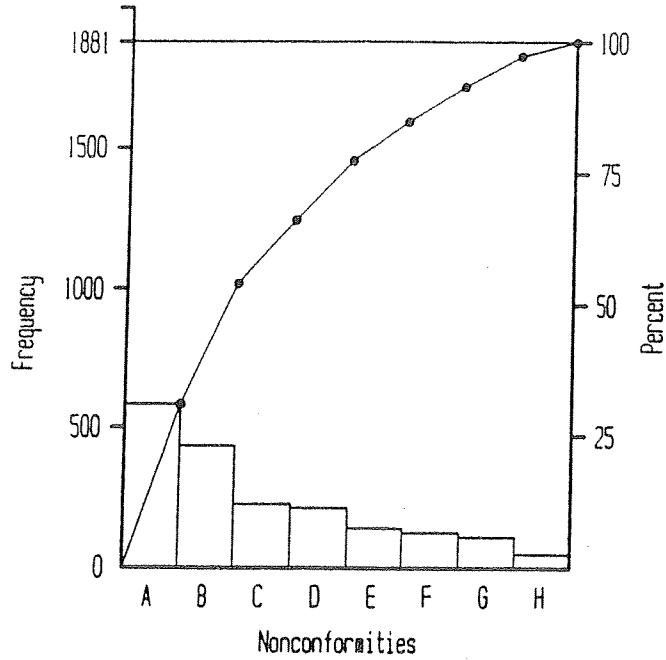


(4)

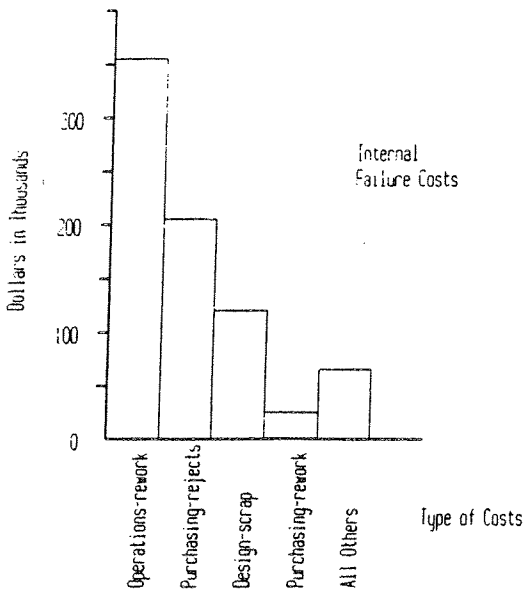


5. Paint Nonconformities: (1-month)

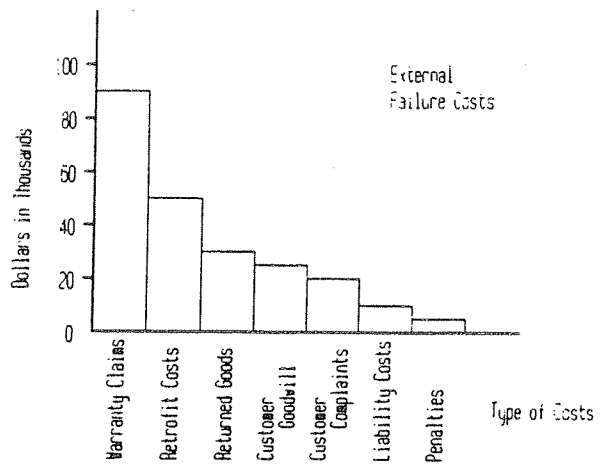
	<u>Frequency</u>	<u>Percent</u>	<u>Cumulative Frequency</u>	<u>Cumulative Percent</u>
A. light spray	582	.31	582	.31
B. runs	434	.23	1016	.54
C. drips	227	.12	1243	.66
D. blisters	212	.11	1455	.77
E. splatter	141	.07	1596	.84
F. bad paint	126	.07	1722	.91
G. overspray	109	.06	1831	.97
H. All others	50	.03	1881	1.00
	<u>1881</u>	<u>1.00</u>		



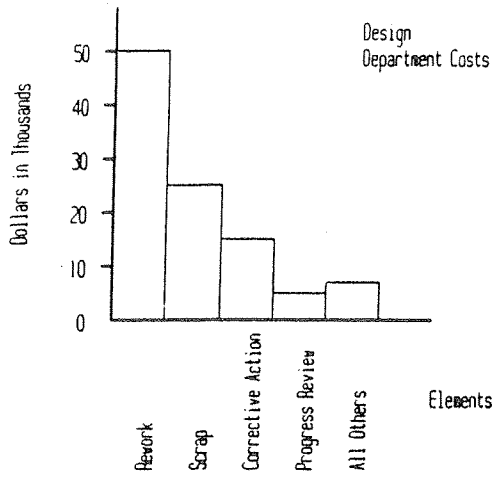
6.



7.



8.



9.

