1965

551

UNDERSTANDING THE "VALUE" ENVIRONMENT

1 Intro selves

4 COURSE Outline. DONT OPEN NEXT PAGE

3 COURSE Objective
Each understand so well that he can not only answer his own Questions but satisfactorily answer those of others

2 Question - what would you like to accomplish.
4-A UNLEARN - ELEPHANT - WOMEN
5 QUESTIONEER - 33 Q
Grade own
each right answer 5%

6 ~~Da~~ 7 - 9 - 10 - 11 - 12 - 13

10 Images

15 Handle the technical
Protect essential images

16 The presidents concepts

17 Give out Assignment I

Systems

6 System - DC 6 - Jet
Piano
Telephone

7 When system lacks something required great is cost--- in perf. or cost.

8 APP PERF - App cost

9 Perf (includes reliability) science
cost is art

10 Cost is Emotional problem

11 DIFF SYSTEM (JET)
TRAINED OPERATORS (")
DIFF ENVIRONMENT (")

12 Give out Assignment I

Questionaire made stron
impact of "no" -
very good
Pack more tech int
it. They want Tech
before value environmen
Don't and Any G. They w
learn - Then ans be obv
Have others Answer.

WORKSHEET MEMO

CLASS VALUE ENGINEERING PROJECT

Item (make sketch)

V.E. is arrangement of techniques which

1. makes clear functions the user wants

2. establishes the appropriate cost for each function by comparisons

3. causes the required knowledge, creativity and initiative to be used to accomplish each function for that cost

Approaches to be followed up

1.

2.

3.

DAY 1 Questions at start of Eng + Mgt Course JAN 1965

Here to make VE tick if I can

Work areas in Rsch [illegible]
Believe it has [illegible] to cost Reduction.

Knowl of application of VE as emphasized DOD staff

Learn some of VA Hope will help a line Supervisor in cost reduction

contracts AF non - NASA
How save Taxpayers get most for $

Want a refresher on mgt tech -
Deal with Aspr clauses -
Hardware [illegible] contracting

Hope course include discussion on development org for system of VA
where fit into structure
also admin. procedures
as well as application to [illegible]

are the tech primarily to basic original design for prod or more applicable to [illegible]

Deal with product
High reliability
~~must not most~~
long time to failure

Can we afford the cost of failure cau-
by VE?

In Buying Business –
can you meas the value of VA ?
~~How~~ do you know not costing
more than most.

I take strong exception to calling
the (cost factors side) "art" for
all time
I realize it is now
but not convinced it has to be –

Does the Technique apply more to
production
Engr'g
Research & Dev ?

How does VA differ from tradit.
Cost cutting tech such as
work simp
methods improvmt - etc

If Eng really does a good
job can VA produce results,

define set of criteria for
determining whether
spec are excessive
in terms of the use of
the product.

Have an activity back of plant are committed
to work with - How ?
Is there a way to evaluate design
alternatives - major cost element
to come later - more effective
Research & Dev costs as well as prod.

any philosophy on trade off between
Reliability and cost reduction.
(cant afford to be sure never will
lose another submarine)

Force systems

Is there a reason Two cos producing
some item
large co cost twice
small co

Not necessary.

Difficulties with proponents of various
things - now VE
What are the merits as appl
to different areas

From Engrs point of view -
like outline to administrate a
specific recommendation
(procedures to make change)

Dont know much about VA
looking at various programs early
some propose complicated!
But how can you prove
to people?

airforce spends on O + M
Have VE in it
not doing any good
why.

ILLUMINATOR ASSEMBLY

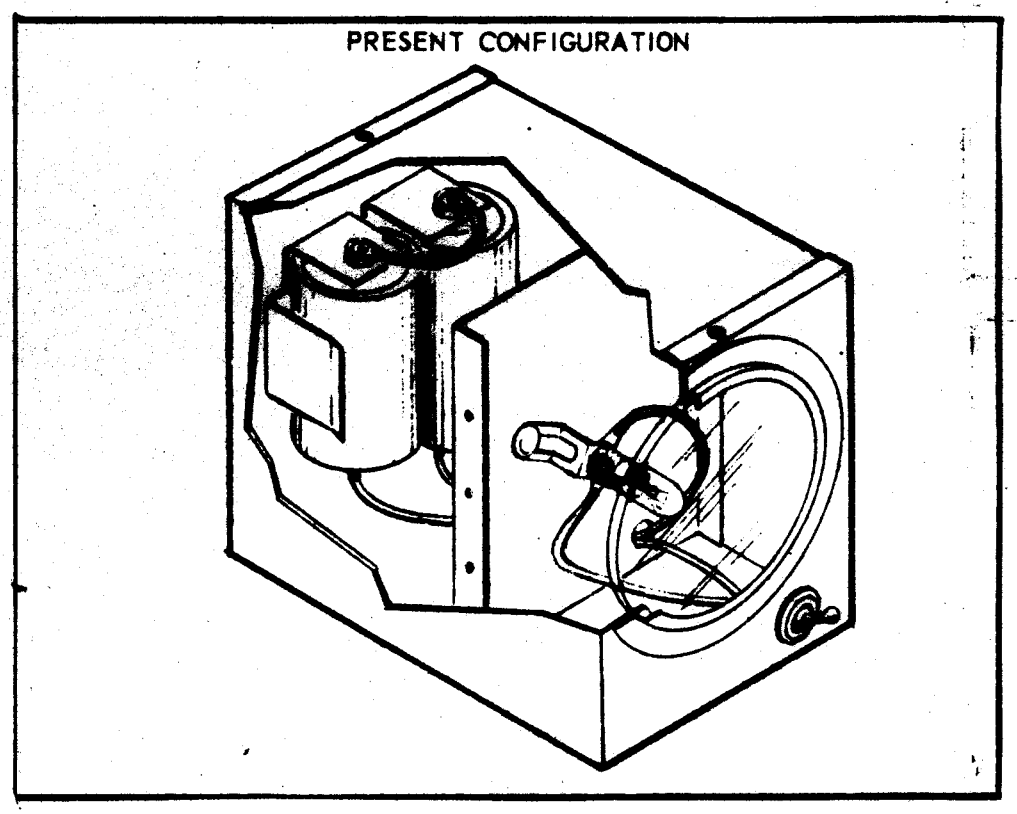
Function -- Providing illumination beneath a frosted glass so that transparencies could be periodically observed.

Quantity -- 24

Equipment resulting from research and development project is shown below.

Cost each -- $52.25.

Equipment essentially consisted of two flashlight batteries, a socket, bulb, and switch in an enclosure.



1965

DAY 2

CALL BY NAMES

REVIEW TO

SYSTEM-PIANO WHAT NEW ?
WHAT MODIFIED ?
HOW SYSTEM WORK ?
WHAT ENVIRONMENT REQUIRE ?

REVIEW A FEW TOP QUSTIONS ABOUT 33 QUESTIO
MEASUREMENTS -- APPROPRIATEIVESS OF COST
WHAT UNITS ?

FUNCTION - USE - AESTHETIC
TIE ETC
TV KNOB

ESTABLISH MEAS.
EVALUATE BY COMPARISONS
(SIMPLE TO COMPLEX)
STUD
DOUBLE NUT

NO MEAS TO OWN PAST

BASIC - SECOND DEGREE FUNCTIONS

7 BUSINESS AREAS

ASSIGNED Q

ASSIGNMENT

DAY 3 1965

HOW STAGE A PICTURE?

REVIEW MISSLE SYSTEM, PIECE OF PAPER · ENG. DEPT

PREMISE - ~~IF HAD~~ MEASURE WOULD HELP

PREMISE PERHAPS FUNCTION/COST

ONE MEAS MIGHT BE COMPARISON
TROUBLED BY INEXACTNESS
NON-TECHNICAL PROX COMPARISONS
WILL THEY DO GOOD
IF SO - IS ONE OF NEW PARTS IN SYSTEM
ARE THEY USUALLY ESTABLISHABLE? IF SO - START-EXTEND
ONE MODIFIED TECHNIQUE - BLAST-CREATE-REFINE

SEND NUTS & STUDS AROUND

SOME EXAMPLES - HANDLES, FILTER, FOCUSING HEAD
TV TUBE ADJUSTER

GO THRU LESSONS 1 & 2

TIE - CHIP ETC USE VS ASTHETIC

BASIC & SECOND DEGREE

MAKE MEASUREMENTS
~~EVALUATE~~ MORE BY COMPARISONS
SWITCH BLADE ETC OIL-BURNER CONTROL

SELL AT COMPETITIVE LEVELS FIX PERF, SALES, OR COSTS

HAND OUT ASSIGNMENT III

DAY 4 - 1965

REVIEW
PREMISE
MEAS WOULD HELP
" CAN BE PRODUCED
" WILL GUIDE DECISIONS

NOW YOU ARE READY TO DEVELOP YOUR OWN ANSWER TO SOME QUESTION
(READ THESE QUESTIONS --)

How would you apply the measures?
who would do it?
How schedule it?
How inform others
How finance it
How meas it
where would you have it report

Then develop answers to -
what are the ground rules now?

How do we work with them

Examples - flashlight

BEFORE LEAVING MEAS - TO DEAL WITH "USE" OF THE
SHOULD HAVE UNDERSTANDING OF
Job PLAN - INFO - AIX - CR - SUB - DEV
USE IT ON 3 EXAMPLES
DISPOSAL STUD, SWITCH BLADE, CONCRETE (Must have SA concrete in text

EXAMPLE ON MULTIPART JOB

DAY - 1965

WARM GOOD
STUD .8 men or boys
STUD 2.5 30,000 For Tools

"ONLY EXAMPLES OUR AREA"

QUESTIONS -
SALES AT MKT LEVELS - THEN FIX IT

IMAGE - ILLUSTRATION APPLIANCE
MARKETING MEN

ASSIGN "PHILOSOPHY OF VE"

"COST FIRST"

GIVE OUT ASSIGNMENT IV

DAS 5 1965

1 Review TQ ✓✓✓✓✓✓✓

nausea — example of mktg — — materials — buying coffee —

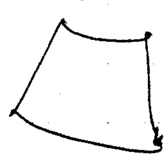
can provide meas — usually Tell which of 7 (✓✓✓✓✓✓)
comparisons to something — not past
often ½ to 1/10 of east or otherwise present
System that has what requires phone — Jet
spot focuser
Handles —

Knowl. use Jet —
Environment
No results with ½ a system

WARM BLOOD

2 DEFINITION

3



I	✓✓✓	✓✓	✓✓	
A	✓✓✓	✓✓✓		
C		✓✓		
J			✓✓	
D			✓	

4 Rept on philosophy paper
Now LEARN BY DEBATE — Talk to find out what believe { Able to defend a[illegible] / implement what bel[illegible]

5 COST FIRST
It will shorten time } Debate by members } use so[illegible] exampl[illegible]
" " lengthen time
Report on paper

~~6~~

6 WILL IT WORK ON R&D
It will
It wont
Report Kapl

DAY 5 — 1965

7 33 Q - RETAKE - ANY THAT BOTHER NOW?

8 WORK OVER WORK SHEET IV

9 START DEVELOPING ANSWERS TO DAY IV Q

10 ASSIGN REPT - COMPETITIVE NATURE OF TODAY

11 ASSIGN NO 5

EXTENSIVE DISCUSSION OF NO 5
WAS VERY GOOD

Told them we would have similar discussions on (1) will it work in R & D?

(2) Does it pay to do it afterwards (one man is very emotional on the idea that after drgs, test spec spare parts instruction books - all changes cost - don't save mo

also develop

3 Is mean the work of Appl eng

4 ~~How will~~ Do we want to do it

5 How we got to do it

6 How should we mess it - #?

DAY 6 1965

many definitions what is -

33 Q uncomfortable with any answers

WHY MEAS MAY BE NEEDED
Rood 6/0 Y
Attitudes, habits, temp circum, lacks info
HONEST WRONG BELIEFS
weld ~~SPACER~~ SEGMENT
Kirksite

Some percentage of all of our beliefs is wrong -

LETS CHECK EACH IMPORTANT ONE AGAINST EVIDENCE + KNOWN IN THE MEAS SYSTEM

Effect of using meas on
Time
Production cost
development cost
-Performance (including reliability - maintainability

Debate -
Does it pay to do it afterward

only some general debate

will it work in R + D
[KAPL Report]

Assigned Q of IV + V
Assign competetitive Paper

DAY 7 1965

I PRES SYSTEM FOR GETTING T LACKS SOMETHING
IT REQUIRES
GETS PERF MISSES COST
EXAMPLES FLASHLITE, FILTER CIRCUIT, PIPEPLUG

II ONE LACK MAY BE THAT AN INCOMPLETE SPEC. IS GIVEN TECHNICAL PEOPLE
PERF. SPEC. BUT NOT ECONOMIC SPEC

III MEANINGFUL COST SPEC CAN BE PROVIDED FOR MANY TASKS BY COMPARISONS, CREATING FUNCTION/COST RELATIONSHIP
EXAMPLES Stud, 200gals, Electronic handles

IV WHEN THIS IS DONE TECHNICAL PEOPLE DO A FINE JOB OF BOTH PERF. + COST
Ex. FILTER CIRCUIT, PIPE PLUG REFRIG. KEEPER, FLASH

V THIS PROCESS OF CREATING IDEAS HAS ITS OWN PROCEEDURES + SKILLS, CAN BE TAUGHT AND LEARNED

VI IT MUST DEAL IN ALL BUSINESS PROCESS's - MKTG - ENG - MFG - MA
Ex. MKTG - INSLEEVES, ENG - GAS TANK, MFG DRILL
MAT'LS - COPPER BAR

VII IT ALWAYS REDUCES PRODUCTION COSTS

DAY 7 1965

VIII OFTEN SHORTENS R&D TIME
Ex FLASHLIGHT PIPE PLUG - GLASS BREAKER

IX OFTEN REDUCES R&D COST
SAME EXAMPLES

X SOMETIMES IMPROVES MAINTAINABILITY

XI OCCASIONALLY PROVIDES NEEDED ADD'L PERF. FACTORS

XII IT IS A REALITY - IT IS HERE NOW
MILITARY NEEDS THE DOUBLE WEAPONS IT PROVIDES
D.O.D. KNOWS LONG HARD JOB TO TEACH ENUF ABOUT & IND. PEOPLE TO GET IT IN.
REST OF WORLD ALSO SEEING ADV.

SO - WHILE WE'D LIKE TO LEARN MORE ABOUT THE PRACTITIONER'S WORK OF CREATING MEAS - LETS GET ON WITH OUR TAS MANAGING IT.

WORKSHEET ASSMNT ~~#~~ IV

ASSIGN VII

DAY 8 1965

ADVISE ON TRAINING - ONE MAN HAS DEFINED TR REQUIRED
ADVISE ON "SAVE"
As we work in forefront of a new technology - have different problems

" what men do not understand they dis-cred

READ THE NEGATIVE STATEMENTS

ASSIGNMENT V

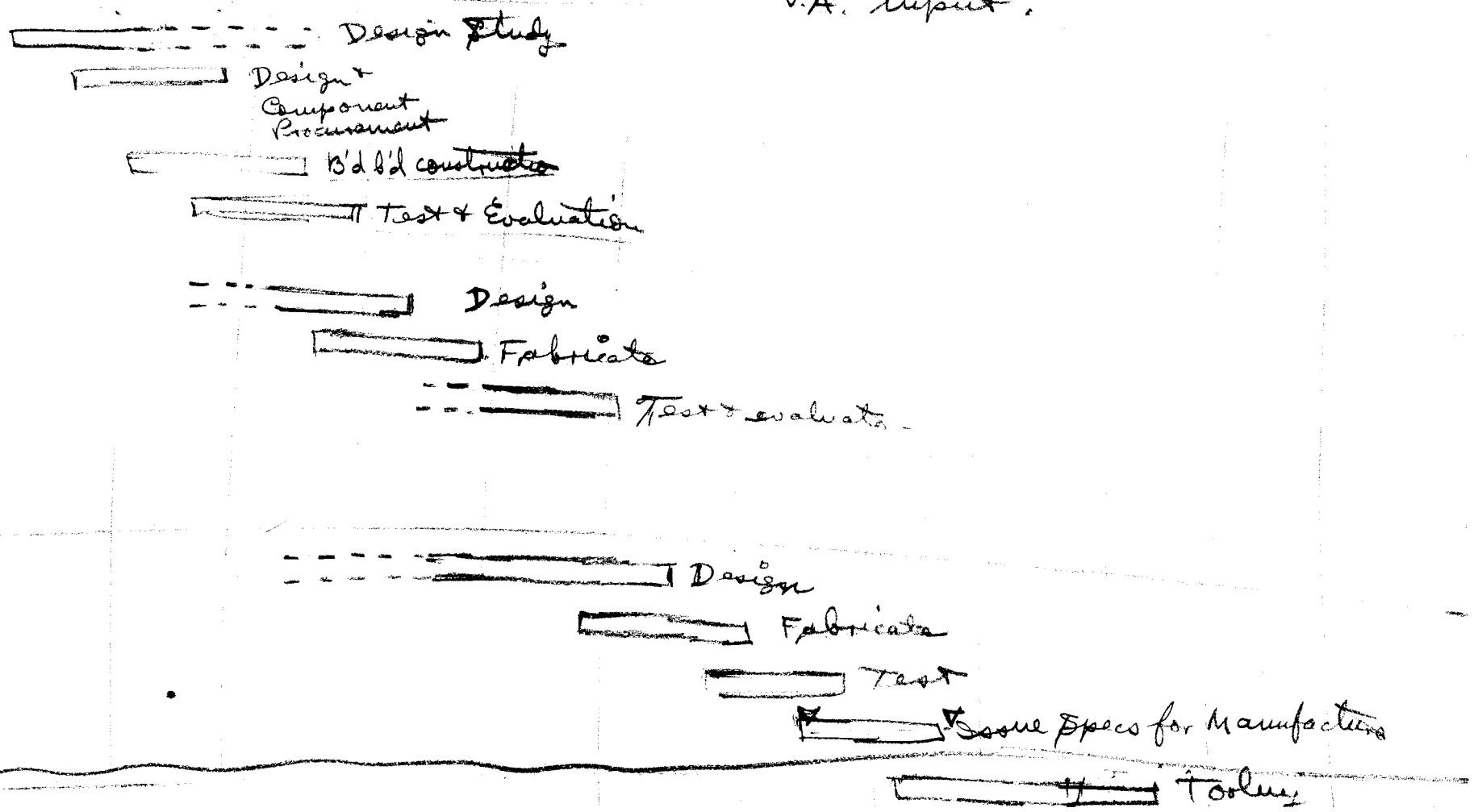
Assignment VI

GIVE OUT ASSMT VIII

DISSCUSS PRESIDENTS CONCEPTS

Task – "Scale up" an existing design – (i.e. electromechanical actuator with 3X force output – similar characteristics, otherwise – ~~completely~~ within ~~the~~ state of ~~the~~ art) with a minimum of overall calendar time to delivery of production procurement.

– Ascertain optimum Value Analysis input for each phase of overall program and describe nature of form of V.A. input.



MAY 9 1965

PHOTOGRAPHER CITES KAPL SEMINAR RESULTS — READ ORIG NEGATIVE COMMENTS
DECISION MAKING THAT PUTS IN EXTRA COSTS

REVIEW ASSIGNMENTS
VI MEASURING
VII RELATIONS WITH OTHER WORK

RECOGNIZE PRESENT DOD INSTRUCTIONS
GET VA DONE
WHAT IS VA ?
HOW SEPARATE ?
OR GET CR SAVING - INCLUDE IT ALL !

How Do we manage in that environme

REVIEW ASSIGNMENT NO VIII

GIVE OUT ANY ASSIGNMTS THEY MISSED

DAY 10 1965

Mixture of Joy + SADNESS
Met -- both part different persons
GRAND GROUP

BUSINESS AS USUAL
ROUTINES AS USUAL
SPECS AS USUAL
RULES AS USUAL
} PROBABLY WILL NO LONGER DO -

MANS HISTORY COMPARED TO 24 hours
MORE CHANGES IN LAST SECOND ---
THAN IN PREVIOUS 23 HRS 59 Min - 59 sec

ANY PRODUCT BOUGHT TO DAY IS ALMOST OBSOLETE
ANY NEW PROCEEDURE OR RULE USED TODAY IS ALMOST OBSOLETE
Quotation - page 26 Eng Bulletin "challenging"
VIII 1 - Personal loss
2 - Management proffdiciency
3 - ~~Environ~~ Environmental Realities

TEST EFFECT OF TIME COST Φ
Read - comments VA early
Questions - from first
" new

Questionaire

SO LONG

Bob Gillespie
100 Stanley Street
North Attleboro, Mass.

Valeu Engineering is an arrangement of techniques which provides measurements of appropriate cost.

First, they clarify precisely each function which the user wants.

Second, they establish a measurement of the appropriate cost by comparisons.

Third, they cause the necessary knowledge, creativity, and initiative to be used to secure each function for that cost.

MANAGING THE USE OF VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment VIII. . . . . Chapter VI
Also "Environmental Realities" and "Management Proficiency"

Management Problems

1. Describe the environment which can be promoted by the attitude of the purchasing agent to generally minimize the personal loss of his buyers and promote decisions most beneficial to his employer.

2. Describe or quote the comments which you, as a manager, might appropriately make to cause more decisions for improving value to be made more promptly in the following circumstances:

   2.1 Your purchasing agent has worked with a casting supplier in buying $10,000-worth of patterns and molds, helping to establish inspection routines, testing and approving samples of production, etc., and has just qualified this supplier for furnishing $100,000 worth of malleable castings per year. He then goes to a convention where he comes into contact with another supplier who has an automatic factory for making castings and who, for a cost of $15,000 for molds, patterns, and tooling would supply the required castings for $50,000 per year.

Assignment VIII

2.2 Your tool engineer has just purchased a $1000 machine which is in the process of installation. Today he discovers a different type of tool which, although also available, was not uncovered in his search prior to the placing of the order. It would produce the items with the same reliability at $5000 per year less cost. The new tool would cost $3000. He now proposes to stop installation, scrap the purchased tool, buy the new tool, and have it installed.

2.3 Your draftsman has just completed a month's work of drawing and detailing the parts of a product you expect to manufacture. He comes to you and advises that he can now see how to use an entirely different approach employing totally different relative shapes. This would necessitate spending another month redoing all of his work but would result in an equally reliable product for half the cost.

"Environmental Realities" Which Will Decrease Value Engineering Results Unless Recognized and Properly Dealt With by Management

1. What people believe you think they are, determines what they must do and say.

2. Men are psychological -- not logical.

MANAGEMENT PROFICIENCY

AMOUNT OF UNNECESSARY COST ESTIMATED BY A GROUP OF 15 MANUFACTURING MEN FROM A VARIETY OF PRODUCT TYPES ON A BASIS OF ESTIMATING THE PROFICIENCY WITH WHICH EACH OF THE SEVEN ACTIVITIES, WHICH CONTROL THE EXTENT OF UNNECESSARY COST, IS DONE.

Management Organization	Marketing Concept	Engineering Concept	Engineering Design Detail	Manufacturing Concept	Manufacturing Operation	Purchasing
75%	75%	90%	80%	80%	85%	85%

Effectiveness measured against 100% is

.75 x .75 x .90 x .80 x .80 x .85 x .85 = 23%

Indication based on their estimates is compared to what is the probable estimate in results which could be attainable at this time

23% of the cost is necessary

77% is unnecessary

Assignment VIII

3. Feelings decide plans and limit decisions.

4. We cannot communicate to men's feelings by logic.

5. Decisions are very personal. Each is based mainly on minimizing the risk of personal loss.

6. Men discredit what they don't understand.

7. Management needs proven results plus understanding to make decisions.

8. Value Engineering techniques are not motivators -- they are do it techniques. Necessary environment must be set by managers.

9. Knowledge is freedom -- lack of knowledge is partial bondage.

10. Creative people are felt to be hazardous by noncreative or judicial people.

11. The new has no chance to succeed in the hands of the one who wants to fail.

12. Never try out the new in the most difficult test.

MANAGING THE USE OF VALUE ANALYSIS AND
VALUE ENGINEERING TECHNIQUES
January 24-February 4, 1965

L.D. MILES

UNDERSTANDING VALUE ENGINEERING

Test

		Check One YES	NO
1.	Is analyzing of bids Value Analysis?	____	____
2.	Is analyzing a design for labor and material content Value Engineering?	____	____
3.	Is questioning the customer on his real functional needs Value Analysis?	____	____
4.	Is studying materials flow in a plant Value Engineering?	____	____
5.	Is getting suggestions from suppliers Value Analysis?	____	____
6.	Is applying better processes Value Engineering?	____	____
7.	Is studying material substitution Value Engineering?	____	____
8.	Does Value Engineering work better on high volume items?	____	____
9.	Does Value Engineering work better on hardware than on maintenance or service?	____	____
10.	We used to find a good supplier, then deal almost exclusively with him. Now I insist on three bids on everything over $100. Is that Value Analysis?	____	____
11.	Our suggestion system asks for everybody's ideas, keeps them on their toes, keeps them thinking. Is that Value Analysis?	____	____
12.	As a purchasing agent -- if instead of accepting the best quotation I negotiate with the supplier for better prices, is that Value Analysis?	____	____
13.	I'm a salesman. If I sell a standard item instead of causing the factory to make something different, is that Value Analysis?	____	____
14.	As a salesman -- if I stop taking a customer to lunch, is that Value Analysis?	____	____
15.	If I as a salesman rearrange my time and route so that I call on my customers with less traveling expense and traveling time -- is that Value Analysis?	____	____
16.	If as an engineer I use a new material that makes just as good a product at lower cost, is that Value Engineering?	____	____
17.	If I design out labor, is that Value Engineering?	____	____

		YES	NO
18.	If I keep all of the utility of the product but eliminate some of the "gingerbread", is that Value Engineering?	____	____
19.	Is shutting down an idle machine when it is not being used Value Analysis?	____	____
20.	Is good creative thinking Value Engineering?	____	____
21.	Is Value Engineering a crutch for poor training and lack of experience?	____	____
22.	If I had 100 engineers working on a design job and saw they were going to be unable to get designs with the required cost levels, wouldn't I just hire a dozen more engineers?	____	____
23.	Wouldn't varied work assignments under competent people in the long run teach a man Value Engineering?	____	____
24.	Does Value Engineering increase the risk factor?	____	____
25.	Could we say that as production engineers we are doing Value Engineering every day?	____	____
26.	If we are having field failures and I design in some more quality, is that Value Engineering?	____	____
27.	As a process engineer, if I find a process that reduces costs, still keeps quality, is that Value Analysis?	____	____
28.	If I study the manufacturing line and find I can rearrange work stations and make the product on one floor instead of two with large savings, is that Value Analysis?	____	____
29.	If I can improve work flow and reduce overtime, is that Value Analysis?	____	____
30.	If by better plans with different job rotation or work scheduling, I can reduce idle time in the factory, is that Value Analysis?	____	____
31.	If I benefit the company by shipping scarce items first to the customers who need them most, then completing shipments to others, is that Value Analysis?	____	____
32.	If as a manager I have two engineering departments and can combine into one reducing the payroll -- still get the same good results -- is that Value Analysis?	____	____
33.	If as a manager I see men who are not doing their jobs well, hire teachers to teach them and, as a result, increase output substantially, is that Value Analysis?	____	____

	YES	NO
34. I study and measure the similar work of two groups, then, by causing each to also use the better approaches of the other, I get 25% more results. Is that Value Analysis?	____	____
35. Do I understand that the words Value Analysis and Value Engineering have exactly the same meaning?	____	____

PRESENTED AT UCLA

ADVANCED MANAGEMENT AND ENGINEERING COURSE

"THE TECHNIQUE OF VALUE ENGINEERING AND ANALYSIS"

GAVE OCT DAY 7 1965

PROBLEM SOLVING SET

INTRODUCTION

Information Step
Analysis Step
Creativity Step
Judgment Step
Development Step

This approach organizes all exercises for problem solving - whether large over-all or small - It is repeated until the needs of any situation have been met.

DESCRIPTION

Information Step

What is the starting point? What is known? What is believed? What is done? Why is it done? Where? By whom? When? For what cost? What are service factors? What are maintenance factors? What are other customer factors? Why done this way? What changes recently made? Etc.? Etc.?

This is information finding - no interpretation, no analysis, no idea generating now -- what are the facts? If not absolutely sure that a statement is true, write it as a "belief".

Analysis Step

What are the meanings? What are the total problems? The individual problems? The reasonable goals and plans? What are the key problems to be first solved? What solutions seem reasonable? What end result is reasonable? What steps--1st, 2nd, 3rd--are indicated? What additional information is required? Etc.? Etc.?

Creativity Step

More completely described elsewhere--hence not duplicated here.

Judgment Step

What approaches show promise, what are most advantages of each? What are advantages and disadvantages? Which is ready now for development? Which should be referred back to another Information and/or Analysis and/or Creativity cycle? What disadvantage becomes the [illegible]

Development Step

The "better answer" is usually 50% to 90% ready to use when it arrives here. Make it 100%. Get firm quotations, get material technical data. Make and test specific principles when necessary. Establish three alternative means of solving any remaining problem that appears difficult. Get others with different fields of knowledge to working on the key problem.
(Textbook "Techniques of Value Analysis and Engineering" - page 20, phases 5 and 6; page 31, items 5, 6.)

RELATIONSHIPS

All parts are interdependent.

Information is useless unless we have a plan to use it to meet a need.

Analysis is worthless unless we have an objective, a plan and valid and complete information.

Creativity is economically valueless unless we have a need, a plan, essential information, analyzed for understanding, stated as a precise problem, to be followed by judgment and development.

The benefits of judgment (if any) are limited by the substance which is to be judged.

Development is "busy work" unless the alternatives meet the need.

These five pieces constitute a "system" which experience has proven produce superior results.

This system will be repeated in many variations and accomplish surprising results for all of you.

L. D. Miles

MANAGING THE USE OF
VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment IV . . . . . Chapters VIII & IX

Setting Objectives, Organizing and Staffing

1. List five objectives of a value engineering program.

2. List five steps in organizing and administering a program.

3. List in approximate order of importance ten traits or characteristics or qualifications of a good value analyst.

4. What must be included in the training of practicioners ?

MANAGING THE USE OF
VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment I . . . . . .Chapter I

Understanding The Value Analysis or Engineering Technology I

1. Name ten matured products on which advances in value engineering will control the success of the business venture more than will advances in performance engineering.

2. Is use value of importance in all products? Explain.

3. Is esteem value of importance in all products? Explain.

4. Who normally makes the decisions concerning use value? On what basis are they made?

5. Who normally makes the decisions concerning esteem value? On what basis are they made?

6. What is meant by a manufacturer's statement about his own product when it says: "Value of this product is unsatisfactory"?

7. Name five products which you consider good value. State why.

8. Describe the effect attitudes previously accumulated under a variety of experiences have on value.

lower cost means lower $

9. Basically, what does a customer really want when he buys a product? What did you want when you bought your latest pair of shoes?

10. List, in order of importance, what you really wanted, or will want, in selecting a refrigerator.

11. Name five products which you have purchased within the past year predominantly for the purpose of accomplishing a use.

12. Name five products which you have purchased within the past year predominantly for the purpose of conforming to a custom, providing appearance, providing interest, etc.

13. Look around the room and note and write down the names of five items and indicate their basic functions.

14. List function or functions of an axe handle and an axe head.

15. Describe the function which a screw driver has specifically in relation to the details of the head of a screw.

MANAGING THE USE OF
VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment II . . . . . Chapter II
Chapter III
Items 1, 2, 4, 5, 1

Understanding The Value Analysis or Engineering Technology II

1. Write down the essential steps in the procedure for action required when a tire becomes deflated in driving along the road.

   Note the inferior results and the increased frustration of omitting any step of the procedure.

2. Select the step in the foregoing procedure which could be omitted with the least consequence, and describe the ill effects, minimized results, or increased efforts caused by omitting just this one step.

3. Sketch a dozen shapes for the operating handle on a toggle switch and suggest a dozen materials which might be used for it. Also suggest a dozen processes which might be used in fabricating the material for the handle.

4. Divide the electric refrigerator into approximately ten "functional areas". For example, one functional area may be "enclosure", a second-"insulation".

5. Describe the steps you would take in order to get away from the generality into workable "specifics" in the case of the following statement: "Underwriters require this type of construction."

6. The factory you are connected with is making parts which have the following costs:

Material	$10
Labor	5
Variable overhead	8
Fixed overhead	12
Total	$35

Vendor quotations for the same parts are $38.

On the basis of the curve for organized action in make-or-buy decisions, at approximately what percentage of factory loading should the item be changed from a "make" part to a "buy" part?

7. State the main purpose of the "blast" portion of the technique, "Blast, create, refine".

8. Describe your interpretation of creativity. What is the basic difference between the creative approach and the analytical approach?

MANAGING THE USE OF
VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment III . . . . . Chapter III
Items 3, 6, 7, 8,
10, 11, 12
Chapter IV
Peruse Chapter V

Understanding The Value Analysis or Engineering Technology III

1. Write a list of twenty-five typical questions which might come up in connection with the design and manufacture of an electric iron.

2. State some of the first actions you might take in order to overcome the road-block: "There must be a good reason for it or we would not have made it that way."

3. Make a list of fifteen different areas of importance to a designer or manufacturer of electric motors in which he might benefit by extreme penetration of knowledge through locating the best possible source of that specialized knowledge

4. Is the cost of each tolerance determinable?

5. Is the function accomplished by each tolerance discernible?

6. Who normally determines tolerances?

7. Are the costs produced by each tolerance normally provided to the tolerance setter before he makes his decision?

8. Name five reasons why vendors' available functional products are often not used even though they would accomplish the function reliably and simply at a much lower cost.

9. Name three ways of paying vendors for the use of their specialized skills and knowledge.

10. State some approaches you might take to determine whether there indeed exists an applicable process to accomplish your purpose.

11. How are tolerances normally determined for a specialty process?

12. Describe some circumstances under which the use of standards costs extra.

13. List some safeguards which might be established to protect against indiscriminately establishing special items, ideas, or processes when there in fact exist standard ones which constitute the best answer.

14. You are now using one million small alnico magnets per year in a thermostat. Name the techniques you are likely to use to identify unnecessary costs.

MANAGING THE USE OF
VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment IV . . . . . Chapters VIII & IX

Setting Objectives, Organizing and Staffing

1. List five objectives of a value engineering program.

2. List five steps in organizing and administering a program.

3. List in approximate order of importance ten traits or characteristics or qualifications of a good value analyst.

4. What must be included in the training of practicioners ?

MANAGING THE USE OF
VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment V . . . . . .Chapter X

Programming

1. Why would a new value consultant have to do a very much more complete job of integration than he would do if he were new in some other job, such as purchasing agent, design engineer, or accountant?

2. Name some of the uncertainties and fears which will exist to some extent in the mind of a buyer when he finds that a value analyst is starting in his purchasing area.

3. Name some of the uncertainties and fears which will exist to some extent in the mind of a design engineer when he finds that a value analyst or value consultant is starting in his area.

4. Who might be embarrassed by a value appraisal?

5. Do you believe that the work of the value analyst, or value consultant, is and must be distinct work carried out separately in order to be done correctly? Or do you believe that it is part of the work of others?

6. What does value appraisal mean to you?

7. What does product evaluation mean to you?

8. What does value consultation mean to you?

9. How would you determine the amount of training needed?

MANAGING THE USE OF VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment VI. . . . . Chapter XI

Measuring

1. Describe several important actions a management may take which unmistakably show emphasis on value work.

2. Describe the manner in which emphasis is applied to a design-engineering project.

3. Describe the manner in which emphasis is applied to shipments of equipment manufactured.

4. Describe measurement systems which might be used to measure the degree of success with which sales work is accomplished.

5. Describe measurement systems which might be used to measure the degree of success with which driving an automobile in an auto race is accomplished.

Assignment VI

6. Describe a system which might be used to measure the degree of excellence of value work.

7. Discuss the pros and cons -- the good and the bad points -- of this measuring system.

8. Describe how you would endeavor to determine (measure) whether or not the correct number of people are engaged in value work.

9. In about 50 words, what is your understanding of the current status of military incentive arrangements in practice?

10. How do we attempt to measure the amount and quality of Value Engineering work which is as a result being done?

Assignment VI

11. What are the significant shortcomings of this measurement system?

12. What are the important benefits of the system?

12-A. What system do you suggest?

MANAGING THE USE OF
VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment VII . . . . . Chapter VII

Relations With Other Work

1. State why value consultants must be concerned with accounting practice.

2. Describe two reasons why all fixed overhead should be included in cost comparisons made for the purpose of determining whether to make or to buy.

3. Name two reasons why some fixed overhead should be excluded from cost comparisons made for the purpose of determining whether to make or to buy.

4. List ten products which are purchased primarily because their appearance or attractiveness appeals to the customer.

5. If your product was losing in sales, although it was competitively priced, how would you determine whether to add appearance functions or use functions?

6. Appropriate cost-reduction work is important and is to be encouraged. State five different ways in which the yield of cost reduction throughout a plant may be improved by the aid of appropriate value analysis work.

7. You, as a value consultant, have been invited by the engineer to develop and provide value alternatives. You have done so. One of them, in your judgment, is extremely workable and practicable and will save a sizeable sum of money. You have given your report and conclusions to the engineer, and your work on the item is finished. A few weeks pass, and you see that no action has been taken. You now feel that you should return to him and further influence him to act on your suggestion. Under these circumstances, discuss the advantages and disadvantages of not going back to the engineer and attempting to exert pressure on him.

8. Your study shows that instead of making the part on the type of equipment which you have in operation in the plant and for which people have training, it can be more economically secured for one-fifth of the cost by buying of a supplier who has another type of machine which your factory does not have. Describe some of the problems you would have to work out and how you would go about doing so.

9. Describe five services which the proper use of value analysis can provide for the management of the business.

10. In your opinion, how can value analysis techniques generally benefit the work of the purchasing agent and his buyers?

11. How will you, as a value consultant, select the vendors on whom you will call?

12. What types of commitments, if any, will you (as a value consultant) make to them?

13. What types of proposals will you solicit from them?

14. Does lower cost usually mean lower quality?

15. Describe how the use of the techniques can assist the salesman in determining what the customer really wants.

16. Describe how the use of the techniques can assist the customer in determining which products best suit his requirements.

MANAGING THE USE OF VALUE ANALYSIS AND ENGINEERING TECHNIQUES

Assignment VIII . . . . . Chapter VI

Management Problems

1. Describe the environment which can be promoted by the attitude of the purchasing agent to generally minimize the personal loss of his buyers and promote decisions most beneficial to his employer.

2. Describe or quote the comments which you, as a manager, might appropriately make to cause more decisions for improving value to be made more promptly in the following circumstances:

   Your purchasing agent has worked with a casting supplier in buying $10,000-worth of patterns and molds, helping to establish inspection routines, testing and approving samples of production, etc., and has just qualified this supplier for furnishing $100,000 worth of malleable castings per year. He then goes to a convention where he comes into contact with another supplier who has an automatic factory for making castings and who, for a cost of $15,000 for molds, patterns, and tooling would supply the required castings for $50,000 per year.

Your tool engineer has just purchased a $1000 machine which is in the process of installation. Today he discovers that a different type of tool which, although also available, was not uncovered in his search prior to the placing of the order. It would produce the items with the same reliability at $5000 per year less cost. The new tool would cost $3000. He now proposes to stop installation, scrap the purchased tool, buy the new tool, and have it installed.

Your draftsman has just completed a month's work of drawing and detailing the parts of a product you expect to manufacture. He comes to you and advises that he can now see how to use an entirely different approach employing totally different relative shapes. This would necessitate spending another month redoing all of his work but would result in an equally reliable product for half the cost.

MANAGING THE USE OF VALUE ANALYSIS AND
VALUE ENGINEERING TECHNIQUES
January 24-February 4, 1965

L.D. MILES

UNDERSTANDING VALUE ENGINEERING

Test

		Check One YES	NO
1.	Is analyzing of bids Value Analysis?	____	____
2.	Is analyzing a design for labor and material content Value Engineering?	____	____
3.	Is questioning the customer on his real functional needs Value Analysis?	____	____
4.	Is studying materials flow in a plant Value Engineering?	____	____
5.	Is getting suggestions from suppliers Value Analysis?	____	____
6.	Is applying better processes Value Engineering?	____	____
7.	Is studying material substitution Value Engineering?	____	____
8.	Does Value Engineering work better on high volume items?	____	____
9.	Does Value Engineering work better on hardware than on maintenance or service?	____	____
10.	We used to find a good supplier, then deal almost exclusively with him. Now I insist on three bids on everything over $100. Is that Value Analysis?	____	____
11.	Our suggestion system asks for everybody's ideas, keeps them on their toes, keeps them thinking. Is that Value Analysis?	____	____
12.	As a purchasing agent -- if instead of accepting the best quotation I negotiate with the supplier for better prices, is that Value Analysis?	____	____
13.	I'm a salesman. If I sell a standard item instead of causing the factory to make something different, is that Value Analysis?	____	____
14.	As a salesman -- if I stop taking a customer to lunch, is that Value Analysis?	____	____
15.	If I as a salesman rearrange my time and route so that I call on my customers with less traveling expense and traveling time -- is that Value Analysis?	____	____
16.	If as an engineer I use a new material that makes just as good a product at lower cost, is that Value Engineering?	____	____
17.	If I design out labor, is that Value Engineering?	____	____

		YES	NO
18.	If I keep all of the utility of the product but eliminate some of the "gingerbread", is that Value Engineering?	____	____
19.	Is shutting down an idle machine when it is not being used Value Analysis?	____	____
20.	Is good creative thinking Value Engineering?	____	____
21.	Is Value Engineering a crutch for poor training and lack of experience?	____	____
22.	If I had 100 engineers working on a design job and saw they were going to be unable to get designs with the required cost levels, wouldn't I just hire a dozen more engineers?	____	____
23.	Wouldn't varied work assignments under competent people in the long run teach a man Value Engineering?	____	____
24.	Does Value Engineering increase the risk factor?	____	____
25.	Could we say that as production engineers we are doing Value Engineering every day?	____	____
26.	If we are having field failures and I design in some more quality, is that Value Engineering?	____	____
27.	As a process engineer, if I find a process that reduces costs, still keeps quality, is that Value Analysis?	____	____
28.	If I study the manufacturing line and find I can rearrange work stations and make the product on one floor instead of two with large savings, is that Value Analysis?	____	____
29.	If I can improve work flow and reduce overtime, is that Value Analysis?	____	____
30.	If by better plans with different job rotation or work scheduling, I can reduce idle time in the factory, is that Value Analysis?	____	____
31.	If I benefit the company by shipping scarce items first to the customers who need them most, then completing shipments to others, is that Value Analysis?	____	____
32.	If as a manager I have two engineering departments and can combine into one reducing the payroll -- still get the same good results -- is that Value Analysis?	____	____
33.	If as a manager I see men who are not doing their jobs well, hire teachers to teach them and, as a result, increase output substantially, is that Value Analysis?	____	____

		YES	NO
34.	I study and measure the similar work of two groups, then, by causing each to also use the better approaches of the other, I get 25% more results. Is that Value Analysis?	____	____
35.	Do I understand that the words Value Analysis and Value Engineering have exactly the same meaning?	____	____

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 1C Value Analysis

Please do not identify yourself in any way.

1. What did you like about the content of this class?

Course was well organized and many physical training aids used to illustrate course content. Obtained good understanding of Value Analysis. Satisfied with what I got out of course.

2. What did you not like about the content of this class?

Class room discussion on occasion got out of hand off on unrelated subjects.

3. What did you like about the instructor?

Of all 3 instructors Larry Miles portrayed the most honest, sincere effort to get the course content across. He was obviously the best prepared and spent most time in preparation.

4. What did you not like about the instructor?

but ~~at~~ class discussion got out of hand at times. Sometimes would not give direct answers or would refer question to group for answer - the ballot of which he brought provided the question eventually gets a right - or acceptable - answer.

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class			✓			
This instructor	✓					

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class Value analysis 15

Please do not identify yourself in any way.

1. What did you like about the content of this class?

the concept of satisfying required cost & maintaining functional reliability

2. What did you not like about the content of this class?

lack of conclusions - specifically how V.E. could be applied in the development stage needs better organization

3. What did you like about the instructor?

Subject familiarity & sincerity

4. What did you not like about the instructor?

inability to develop concepts & conclusions from class discussions

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class				X		
This instructor				X		

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class Value Engineering

Please do not identify yourself in any way.

1. What did you like about the content of this class?

Subject - special interest.

2. What did you not like about the content of this class?

—

3. What did you like about the instructor?

Presented approach well - obvious caution and patience from past resistance and misunderstand of subject matter. Handled same resistance and misunderstandings of class well.

4. What did you not like about the instructor?

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class		⊢	⊣			
This instructor		⊢	⊣			

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 18

Please do not identify yourself in any way.

1. What did you like about the content of this class?

The approach for allowing the class to establish amongst ourselves the value of VE – rather than the lecture approach.

2. What did you not like about the content of this class?

3. What did you like about the instructor?

I like the honest & sincere approach used – it is refreshing

4. What did you not like about the instructor?

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class	✓					
This instructor	✓					

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 12 Mech

Please do not identify yourself in any way.

1. What did you like about the content of this class?

NEW CONCEPTS TO ME.
MUCH NEEDED

2. What did you not like about the content of this class?

NOTHING

3. What did you like about the instructor?

VERY DEDICATED TO STUDENTS.

4. What did you not like about the instructor?

NOTHING.

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class		✓				
This instructor		✓				

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 18 MILES

Please do not identify yourself in any way.

1. What did you like about the content of this class?

A good presentation on the basic concepts & principles of IE. Has been effective in getting rid of some false notions about what IE is.

2. What did you not like about the content of this class?

Too much irrelevant class participation & discussion. I wanted to hear more specific & direct replies from instructor.

3. What did you like about the instructor?

Very much enthused about subject. Tried to answer every question posed. I admired his enthusiasm that his greatest desire was to get the "story" of IE across to the class.

4. What did you not like about the instructor?

Let the class get off on too many discussions away from point & let participants air their own impressions.

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class		X				
This instructor		X				

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class #15 [illegible]

Please do not identify yourself in any way.

1. What did you like about the content of this class?

Clarification of the [illegible] [illegible] can be [illegible]

2. What did you not like about the content of this class?

3. What did you like about the instructor?

The [illegible] with which the [illegible] was [illegible]. His [illegible] [illegible] in establishing Value Analysis [illegible].

4. What did you not like about the instructor?

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class	✓					
This instructor	✓					

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 18

Please do not identify yourself in any way.

1. What did you like about the content of this class?

The distribution of props and adequate equation to the subject material

2. What did you not like about the content of this class?

Did not cover into the aspects of how V&E. should be managed in the performance of military contracts.

3. What did you like about the instructor?

Speaks very clearly

4. What did you not like about the instructor?

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class				✓		
This instructor						

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 18

Please do not identify yourself in any way.

1. What did you like about the content of this class?

2. What did you not like about the content of this class?

3. What did you like about the instructor?

4. What did you not like about the instructor?

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class						
This instructor						

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 18

Please do not identify yourself in any way.

1. What did you like about the content of this class?

Causes you to think.

2. What did you not like about the content of this class?

Gives no examples of applications to labor saving techniques.

3. What did you like about the instructor?

Takes times to answer all questions.

4. What did you not like about the instructor?

No dislikes

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class				✓		
This instructor			✓			

18

Everything

Nothing

held to the point and cleared up all loose ends

Something

X X

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class _____

Please do not identify yourself in any way.

1. What did you like about the content of this class?

2. What did you not like about the content of this class?

3. What did you like about the instructor?

4. What did you not like about the instructor?

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class						X
This instructor						X

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class _____

Please do not identify yourself in any way.

1. What did you like about the content of this class?

Not Much

2. What did you not like about the content of this class?

- Presentation
- Content

3. What did you like about the instructor?

4. What did you not like about the instructor?

- Presentation
- Procrastination With Deadlines of Others
  s/ Was Defensive s/ Not Responsive to Class
- Not at all Responsive to Class Ques
- Communication Problem

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check: I think so

	1 (best)	2	3	4	5	6
This class				X		
This instructor				X		

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 18

Please do not identify yourself in any way.

1. What did you like about the content of this class?

New - practical, convincing

2. What did you not like about the content of this class?

Too much time

3. What did you like about the instructor?

Dedication, ease of understanding.

4. What did you not like about the instructor?

Handicapped by too much time.

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class		✓				
This instructor		✓				

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 18

Please do not identify yourself in any way.

1. What did you like about the content of this class?

The VA Example

2. What did you not like about the content of this class?

To much time spent on minor details in class discussion

3. What did you like about the instructor?

He is a gentleman

4. What did you not like about the instructor?

Not precise enough - got off subject to easily

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class					✓	
This instructor					✓	

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class 18

Please do not identify yourself in any way.

1. What did you like about the content of this class?

The subject matter in general - specifically discussion related to definitions and techniques. The details of Value engineering

2. What did you not like about the content of this class?

The constant emphasis on the GREATNESS of V.E. Too much sales talk.

3. What did you like about the instructor?

His depth of knowledge of the subject.

4. What did you not like about the instructor?

Sales talk to justify the existence of V. Lacked directness in presenting subject matter - too willing to let class define and decide.

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class			✓			
This instructor			✓			

INSTRUCTOR'S CONFIDENTIAL CLASS EVALUATION

Class _____

Please do not identify yourself in any way.

1. What did you like about the content of this class?

2. What did you not like about the content of this class?

3. What did you like about the instructor?

4. What did you not like about the instructor?

In comparison with my other Engineering and Management Course classes and instructors, I would rate:

Please check:

	1 (best)	2	3	4	5	6
This class						
This instructor						

1965 ENGINEERING AND MANAGEMENT COURSE

ROOM ASSIGNMENTS

CLASS NO.	INSTRUCTOR	DESCRIPTION	ROOM
		Early Morning	
1A	Phelps	Speech and Voice Training (Does not meet on Monday, January 25)	2214
1B	Meador	Speech and Voice Training (Does not meet on Monday, January 25)	2236
1C	Rosenthal	Speech and Voice Training (Does not meet on Monday, January 25)	2250
25A	Jensen	Reading Laboratory	2317
25B	Nicholaw	Reading Laboratory (All participants in Class 25 meet in Room 2236 at 7 am, Monday, January 25)	2319
		Period I	
2	Sprowls	Electronic Data Processing (Room 1264 on Thursday, February 4)	2250
3A	Jasinski	Leadership Principles	1246
4A	O'Donnell in Charge	General Management Principles	1256
5A	Reisel	Laboratory in Leadership	4240A
5B	Rosen	" " "	4320B
6	Van de Water	The Management of Industrial Relations	2214
7	Archibald	Network Based Project Management System (PERT/CPM)	1234
8A	Bugental	Processes of Communication (Room 1222 on Thursday, February 4)	2236
		Period II	
4B	O'Donnell in Charge	General Management Principles	1256
5D	Reisel	Laboratory in Leadership	4240A
5E	Cannon	" " "	4320B
5F	Shedlin	" " "	4357B

CLASS NO.	INSTRUCTOR	DESCRIPTION	ROOM
		Period II (Cont.)	
8B	Bugental	Processes of Communication (Room 1222 on Thursday, February 4)	2236
9	Boldyreff	Mathematical Bases for Decision & Programming (Room 1270 on Thursday, February 4)	2224
10	Sprowls	Industrial Statistics & Quality Control	2250
12	Carrabino in Charge	Principles of Production & Operations Mgt.	1246
13	Carson	Accounting for Engineers and Managers	1234
		Period III	
3B	Porter	Leadership Principles	1246
5G	Lasko	Laboratory in Leadership	4240A
5H	Greening	" " "	4320B
5I	Haigh	" " "	4357B
14	Stillson	Industrial Operations Research	1256
15	Powell	Business Policy (Also 2317, 2319)	2236
16	Brighouse	Industrial Psychology (Also 2325)	2250
17	Gardner	Profit Management and Cost Control	1234
24	Dash	Managing the Industrial Engineering Function	2214
		Period IV	
4C	O'Donnell in Charge	General Management Principles	1256
5J	Barthol	Laboratory in Leadership (Meets in Room 2317 on Wed. Jan 27 & Wed.,Feb.3)	4240A
5K	Broen	" " "	4320B
5L	Porter	" " "	4357B
11	Vaill	Leadership in the Small Task-Group	2236
18	Miles	Managing the Use of Value Analysis	1234
21	Kapernaros	Configuration Management	1246

CLASS NO.	INSTRUCTOR	DESCRIPTION	ROOM
		Period IV (Cont.)	
22	Weller	Engineering and Research Management (Room 1222 on Thursday, February 4)	2250
23	Halff	Planning - Structure and Cases	2214
		Late Afternoon	
1D	Phelps	Speech and Voice Training (Does not meet on Thursday, February 4)	2214
1E	Meador	Speech and Voice Training (Does not meet on Thursday, February 4)	2236
1F	Rosenthal	Speech and Voice Training (Does not meet on Thursday, February 4)	2250
25C	Jensen	Reading Laboratory (Does not meet on Thursday, February 4)	2317
25D	Nicholaw	Reading Laboratory (Does not meet on Thursday, February 4)	2319