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American Society of Tool Engineers

NORTHERN NEW JERSEY **CHAPTER No. 14**

MEETING: TUESDAY, APRIL 10, 1951

HOTEL ROBERT TREAT 8:00 P.M. SHARP

NEWARK, NEW JERSEY

SPEAKER: MR. L. D. MILES

SUBJECT: "TECHNIQUES OF VALUE ANALYSIS"

Mr. L. D. Miles' work at the present includes the organization and development of purchasing value analysis groups throughout the various branches of General Electric Company, the training of men for effective work in these groups, and the development of new and more effective methods for carrying out value analysis work.

Chairman, Albert J. Schmidt

DATES TO REMEMBER

May 8, 1951, Regular Meeting - Speaker: Mr. H. J. Greif
Subject: "New Welding Methods and Rods for Salvaging of Tools"

June - Annual Chapter 14 Picnic to be held at Doerr's Grove

NORTHERN NEW JERSEY CHAPTER No. 14

ALBERT J. SCHMIDT, Chairman
H. WILSON RYNO, Secretary
1060 Broad Street, Newark, N. J.

L. D. MILES

Mr. Miles was graduated from the Univ. of Nebraska with a degree in Electrical Engineering in 1931. He came to General Electric Company on their "Test" course for student engineers. Thereafter, he entered the Engineering Department of the Vacuum Tube Design Group.

In 1938, he transferred to the Purchasing Department under Harry Erlicher. During the war, he was assigned for four years as Purchasing Agent of the Locke Insulator Corporation affiliated with General Electric Company, located in Baltimore, Md. In 1947, he was recalled to the Schenectady Office to organize an activity which would bring better value on a wide scale into the purchase and use of materials. This activity was called Value Analysis.

With a small group of engineers in the Schenectady Purchasing Department, he has developed methods and techniques which have resulted in eliminating millions of dollars of "wasted' cost from the Company's products.

In recognition of this achievement, the Company last year presented him its highest award for extra achievement, known as the Charles A. Coffin Award, given in memory of the Company's first President.

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TALK GIVEN TO

AMERICAN SOCIETY OF TOOL ENGINEERS

NEWARK, NEW JERSEY

April 10, 1951

TECHNIQUES OF VALUE ANALYSIS

At a recent Chicago meeting I was told thst the average number travelled 60 miles total to attend. I know that Newark is no exception and will endeavor to pay you an honest return for your efforts.

I will show you that through Purchasing Value Analysis 15 to 20 percent of the cost of most products can be removed - that in a real sense much of the benefit is the result of good work of tool engineers - and how, through combined efforts we call can accomplish more.

Purchasing Value Analysis was started in General Electric Company three years ago to develop basic procedures for eliminating every dollar - evey cent - of "wasted" cost - that is, - cost which does not contribute to the performance of the product.

Now, I'm taking chances tonight. We will show actual examples of lack of value found in our parts. Please don't think that they are all bad! Or that we are any worse than others - I assure you that we are not. I have examined some of their products.

We chose the simplest approach imaginable "considering the job each part does, is it worth what it cost?" Studying each part in light of its function and its cost, is it worth the money?

(Exhibit the Refrigerator Cold Control) This spotlight shows some interesting vistas. A mounting strip was made of phosphor bronze - no flexing - no current conductivity - still 65¢ per lb. Tinned spring steel would save half.

A small copper tubing 2 ft. long has ends of different sizes. Grades of larger and smaller tubing had cost $100,000 for a year's supply. For three weeks we searched - called vendors - solicited their suggestions - then came the answer. By using the larger size only and swaging one end smaller, a year's supply cost $60,000 - $40,000 saved with identical performance.

In fact, in job after job Purchasing Value Analysis was bringing new value into the products. In dozens of products made in widely separate plants it was proven that this approach did eliminate large dollars of "wasted cost" that is, cost which does not contribute to performance.

(Ad lib elbow story)

What is done? A Purchasing Value Analysis group consists of two or more men in the Purchasing Unit.

With engineering experience
Creative imaginatinn
Knowledge of material.

On each project they start with all known facts.

Product
Parts
Drawings and specifications
Complete cost breakdown
Planning and labor charts.

They then make certain that viewing every usable idea, process, material and supplier, each part individually and the group of parts when considered as a unit represent value.

The analyst, working with the engineers, the manufacturing men and the buyer, makes an intensive study to lower material and parts costs by substituting, eliminating, combining, simplifying,

or otherwise altering through the application of a knowledge of materials and prices, the use of vendor's specialized skill and by purchasing negotiations.

The function, the construction, the manufacturing methods, the sources of supply and the purchasing arrangements for each part and each material are reviewed.

Some of their most powerful assistants are the tool engineers of vendor companies.

The spring story - (ad lib)

(Use slide #1 when you hear - "They turned in one of the finest jobs I have seen; five different classes of springs, etc." Remove the side at the end of the spring story, but leave the room darkened).

Value Analysis work is by no means a substitute for other effective value improvement work being done througout every Company. It is instead an added facility and other tools can make their work far more effective. The Purchasing Value Analyst must bring new information and open new possibilities to his Company. Specialty suppliers who excel in their own fields must be searched out, problems outlined to them and their facilities, abilities and genious must register impact against "wasted" cost.

For example, in another of our devices is a quartz rod used for its thermal expansion properties. (Slide 2) It costs 32¢. It was an important cost factor in the device. What could be done about it?

The supplier's Sales Manager and Engineer were invited in. For three hours no usable suggestion came forth - then from the engineer - "Why don't you use tubing instead of rod (Slide 3) and save one-third!" Had we stopped short of three hours, no result would have been accomplished! Then, as often happens, this new approach opened up other possibilities (Slide 4). Instead of the pin mounted on the quartz number costing 17¢ - 8½ for the pin, 4½ for the sleeve, 4 for cementing - our engineer proposed a 5¢ pin on the right. Another 12¢ saved!

But the Purchasing Value Analyst pointed out that even that contained waste material - material not working. "Design it up like a nail with the head in the center (Slide 5) and it will not cost 17¢ nor 5¢, but 2¢". The overall result of this purchasing impact on "wasted cost" was (Slide 6) - cost reduced from 49¢ to 23¢ with identical performance.

(Remove slide and turn on lights)

Is every cost proportionate to functions?

Is every usable vendor's product included?

Is every usable vendor's process evaluated?

Is every usable vendor's new material considered?

In other words, has every tool designer had an opportunity to do his stuff?

Ad lib 5¢ nameplates
18¢ nuts
Automatic tapping of small holes
Aluminized steel

Nor are our results limited to large volume items. Ad lib.

50 instruments $58.00 to $28.00
100 instruments $180.00 to $120.00

Then in the other extreme the stainless steel pin $4.00 per M to $2.00 per M - $100,000 saving.

A short time ago, one of our managers called saying, "I've heard a lot about Purchasing Value Analysis -- it sounds good, but we have such an excellent cost reduction activity which includes Manufacturing, Engineering, and Purchasing that I don't believe you could do us a dollar's worth of good."..."Maybe you're right--we are willing to prove it one way or the other."..."How would you do it?"..."You send to our office a complete device, and a sample of each part that goes into it--also, present costs, a set of drawings and labor planningcards--and, while we're at it, send along a Purchasing Engineer for six weeks. We'll rest our case on the evidence." The next day we called saying, "When and how do we start?" Two days later, the job was underway...Results! Forty-six parts with total cost reduction of $101.

One part costing $4.15 could be made somewhat differently and purchased for 15¢.

Five parts averaged 50¢ each less from better suppliers.

On 14 parts, vendors' standards or near standards were found in lieu of special parts saving $3.50.

On six parts, the Purchasing ideas brought forth resulted in Engineering changes saving $8.00.

On ten parts involving Purchasingand Manufacturing, $14 was saved.

On tem parts involving Engineering and Manufacturing, $19 was saved.

On five additional parts, ideas brought forth by Purchasing resulting in Manufacturing and Engineering changes brought $50 saving.

Of course, the manager was sold - He won't operate without

Purchasing Value Analysis from now on.

How is it done!

By questioning every cost and every feature which adds to cost.

By relating function to cost (Ad lib)

By evaluating every part whether purchased or manufactured.

By establishing fair value as a yardstick.

What is value?(Ad lib)

Seriously, value isnot determined by a study of the subject - but rather by a detached subject of almost everything else. The value of the razor is not the cost of the steel and chromium labor - but rather the cost of something else to shave as well.

In a beauty contest the most exotic bit of flesh and limb is not determined by a microscopic study of the cell structure, but - proper or improper examinatiam of other similar material establishes her "value".

Ad lib.

Controller shaft 3¢ to $1.10.

Switch collars 4¢.

Switch parts 4¢.

Let's look at some more examples (Ad lib)

Better condition or control

Screws 36¢ - 1/2¢

Nuts 18½¢ - 1/2¢

Terminals 10¢ less.

Undercut cover screw.

Question every cost!

1. Eliminate the part.

   a. Change another part to perform its functions

2. Simplify it.

   a. Put all of the tapped holes into one part - eliminate them from the others.

   b. Use available fastening devices and eliminate tapping entirely.

   c. Challenge secondary operations.

   d. Make the parts straight instead of curved.

3. Alter it so that a high speed method can be used.

   a. With a slight change, perhaps it can go on a header or upsetter.

   b. Strike the slot instead of saving it.

   c. Drill and tap small parts in the strip before cutting apart.

   d. Consider tubular rivets instead of solid for lower cost and faster assembly.

4. Do the operation in a gumbling barrel.

5. Alter--so that standard parts or materials may be used.

   a. Design around standard parts, rivets, eyelets, washers, spacers, etc.

   b. Specialty vendors provide standard materials in many classes. Use standard terminal boards, standard contact blades, standard contact blade spacers, etc.

   c. Design for standard bushings --don't make it necessary to cut them off.

6. Use a lower cost, fully acceptable material.

   a. Buy an aluminum or other disc instead of sheet or strip stock.

   b. Use more magnesium extrusions. Magnesium tubing is lower cost foot for foot than either aluminum or copper.

   c. Don't use drill rod if steel rod will do the job equally well.

7. Use a higher cost material, which, by its nature and properties will afford a simplified design and facilitate lower cost assembly.

8. Don't spend money for sizing if supplementary operations are necessary anyhow.

9. Make as many parts as practicable on a particular job of identical raw material.

10. Check it against other methods of fabrication.

    a. Fabricate it.
    b. Die cast it.
    c. Extrude it.

11. Check it against unique, less well-known methods of fabrication.

    a. Lost wax casting.
    b. Miniature casting.
    c. Electro-forming.
    d. Low cost, low quantity stampings.
    e. Fabrication from copper or brass tubing.
    f. Powder metallurgy.

12. Check unusual but available raw materials for use on the job.

    a. Preplated steel.
    b. Expanded metal
    c. Embossed metal.

13. Determine where the design might reasonably be altered for automatic assembly.

14. Survey the purchasing with the buyer.

    a. Are all available highly specialized suppliers being used?

    b. Have their engineers been given sufficient facts and pressed for suggestions which would produce equivalent performance at lower cost?

    c. Has the buyer utilized the know how of other purchasing units in his area using larger quantities of similar material?

    d. Should some minor changes suggested by the supplier which afford lower cost material, be considered further?

    e. Has the buyer found the basic source, the manufacturer who may be in a position to extend minimum prices?

    Any cost is too high if it can be reduced!

    Is there a dime of cost which doesn't bring a dime in performance?

What does Management do about it?

Ad lib.

Know the facts before making decisions.

Make it or buy it.

One plant asked for evaluation of 12 parts. Of the 12 selected, 6 were not value.

6¢ part worth 3¢

20¢ part worth 5¢

50¢ part worth 10¢

Corrective changes made by Management.

Let's look at some more examples. (Ad lib)

Bracket 42¢

Bracket 17¢

Speaker pole piece

Stainless steel shaft - 1 piece or 2

10 Tests For Value

Until we can measure value as accurately as the engineers measure volts or watts, we are stumbling in the dawn. In fact, we have only started--but several hundred cases of Value improvement have been classified and studied with the resulting "10 Measurements of Value" (SLIDE 7) which will help to point out loss of Value in 99 of 100 cases.

(SLIDE 8) 1. Does its use contribute Value?

(SLIDE 9) The nameplate adds 5¢ to cost but being mounted under a cover adds little to Value. (SLIDE 10) Put a monogram on the molded cover and save the wasted cost.

(SLIDE 11) 2. Is its cost proportionate to its usefulness?

(SLIDE 12) For the simple function of transmitting a small amount of mechanical motion from the quartz member to the relay, 17¢ is an improportionate cost. Do the job for 2¢ and value is regained.

(SLIDE 13) 3. Does it need all of its features?

(SLIDE 14) Grinding the ends of a spring may cost five times as much as winding. Eliminate the grinding unless it makes a contribution to Value.

(SLIDE 15) 4. Is there anything better for the intended use?

(SLIDE 16) The spacer on the left made from a steel rod undercut to reduce weight costs 90¢. The spacer on the right made from an aluminum disc is even lighter--costs 20¢.

(SLIDE 17) 5. Can a usable part be made by a lower cost method?

(SLIDE 19) 6. Can a standard product be found which will be usable?

(SLIDE 20) Believe it or not, the small nut on the left cost 18½¢. No standard could be used because of nut corner interference with an adjacent part. During the Purchasing search, a specialty supplier who marketed a suitable list of non-standards was located and a part giving identical performance could be purchased for ½¢.

(SLIDE 21) 7.8 Is it made on proper tooling--considering quantities used?

(SLIDE 22) Designed when smaller production was expected, this stainless weld nipple was made by purchasing a standard fitting and machining away part of it at a cost of 20¢. However, with present quantities of 12,000 a year it should be made on a screw machine and an identical part cost 5¢.

(SLIDE 23) 8. Do material, reasonable labor, overhead and profit total its cost?

(SLIDE 24) 3¢-worth of steel with the ends turned, no close tolerances, still a cost of $1.07. Certainly it is not a reasonable cost. Considering the material, labor, overhead and reasonable profit, it is worth about 20¢.

(SLIDE 25) 9. Will another dependable supplier provide it for less?

(SLIDE 26) The question which is of everyday importance to all of our buyers--the right vendor, the right ordering quantities and the cost drops from $10 per M to $7 per M.

(SLIDE 27) 10. Is anyone buying it for less?

A little time spent in deep thought. Who else uses this type of material? How is he providing it? What possible means is he using to get better value than we are?

(SLIDE 28)

CONCLUSION

We conclude with the thought that in the future newer products for better living manufactured at constantly decreasing costs, supporting a constantly increasing standard of living, will result from the ingenuity, efforts and perspiration of tool engineers.

Better products for lower costs will be the award to the public for the skill and industry of tool engineers.

In making better goods available to 130,000,000 Americans, we cannot get ahead of our tools -- we are endeavoring to keep pace with them.

L. D. Miles
April 13, 1951

LDM:MWE