



Society of American Value Engineers

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RITA BATES
Business Manager

December 22, 1981

Mr. L. D. Miles
Sedgefield
Route 5, Box 840
Easton, MD 21601

Dear Larry:

We would like to print your paper, "Value Analysts - Teach Your Purchasing People To Buy Functions To Offset Inflation," which appeared in the 1980 SAVE Conference Proceedings, in our next issue of Value World. Due to space limitations, however, we would like to edit this paper to fit the space. I have enclosed a copy of your paper with Jim Vogl's markings. Please let me know if this editing has your approval as soon as possible, as we are scheduled to go to the typesetter with it on January 5. If you cannot reach me at the office during this holiday season, please feel free to call me at home (817-640-1278).

If permission is granted, publication would, of course, acknowledge the source, i.e., Reprinted (abridge) from SAVE Proceedings, 1980.

Sincerely,

Rita Bates,
Business Manager

RB:es
Encl.

Value Analysts — Teach Your Purchasing People To Buy Functions To Offset Inflation.

Larry Miles

Sedgefield, Easton, Maryland

GETTING THE BUYER INTERESTED IN THE V.A. APPROACH

A ~~the~~ Value Analyst located the buyer of materials for 12 huge waterpower hydro-electric equipments. He asked, "have you yet ordered the materials for that job?" The buyer answered, "some of it, I'm in the process of getting the orders out now". Then followed conversations and actions which were to benefit the company earnings over \$100,000.

V.A. The company had very severe off-shore competition on that job and to get the job, made a very low bid. We told the sales department that we would help them keep the quality and get some lower costs. Now its time for us to do it — starting with the purchase of the materials. Have you ~~yet~~ ordered the 1/2" x 2" copper bus which the factory fabricates into windings for the generators?

Buyer. No, we haven't sent them out. We have the specifications and the material list. We have quotations. They are ready to go. As you know they use 1500' on each of the 12 equipments. That size of material is available in 300' maximum lengths. We will be ordering 60 lengths to make up the 12 1500' windings.

CONCENTRATING THE BUYERS ATTENTION ON THE FUNCTION

V.A. Do you mind if we use the VA approach on all of the material for this job? I'd like to help you learn it and help you do it. It concentrates attention on the function or use or purpose of what we buy. What does it do for us? Then it associates all costs with "what it does". We relate this usefulness or function directly with what you pay for it, and what we must later add to make it fully useful. We call that identifying the function and evaluating the function, i.e. putting a value in dollars on what its going to cost to get that job done — at that stage of the thinking. Then with that in mind we search very hard for means, costing less, to achieve it.

Buyer. If it pays off and doesn't load us up, or delay the job too much, I'm for it.

VALUE ANALYST AND BUYER GATHER INFORMATION ON PRESENT METHODS

They walked through the factory and saw the equipment for uncoiling and handling the copper bus. They saw a large area for feeding the bus into equipments which shaped and cleaned the ends and facilitated silver brazing the pieces together, followed by reshaping and cleaning, ^{on} exacting and costly operation. The VA said, all of these costs go to produce one function, conduct electric current. Other costs are for the functions of shaping it so it will perform on the alternator, and ~~the~~ insulating it so it can be mounted in the equipment. Now we take a tight look at each function with the question, "how can we perform all of the functions without all of the cost?"

The buyer was already catching the spirit and technique of it.

Buyer. All of that silver brazing work and expense really doesn't do anything for us, doesn't provide any useful function. ~~if they didn't ship it in short pieces. Still the materials handbook that all suppliers have standardized~~ lists 300' as the maximum for those large sizes. I expect they make it in a continuous mill. I wonder why they ~~cut~~ cut it off, I'll find out.

IT is needed
because

FINDING A BETTER METHOD

~~Off to~~ ^{AT} the copper mill, the buyer saw, as he had expected, the bus coming out in continuous length, then ~~with~~ a flying shear cutting it ~~off~~ into 300' lengths. He made contact with the decision making management at the mill, told them of the need for 1500' lengths, and discussed with them what he called their anti-function treatment of the piece, in cutting it into small lengths. They checked the mechanics of it. They found that a 1500' length of that particular size would wind nicely

onto a skid. Next day they made one. Next week it was in the buyers factory. All of the costs and concerns and inspections of the entire silver brazing operation were ended. Manufacturing could be condensed and streamlined. It handled so well for the copper mill that they lowered the base price of the copper.

BUYER SEES THE GREAT BENEFITS FROM THE FUNCTION APPROACH

VA. That's what we mean by a buyer buying function. He makes it his job to see that each cost is necessary to help provide a wanted function. Buyer. That worked fine. I can probably do it on the small items.

VA. Small items of course, but why not the big items where the big dollars are? Buyer. They are covered by specifications and drawings and tests. They are too involved for a buyer to get into. For example ~~the~~ flanged steel shaft which is 3' in diameter and 30' long with a 6' diameter flange on one end. It costs about \$1.00/lb as a rough machined forging. Dimension, structure, analysis, everything is thoroughly specified. Only two places in the country ~~could~~ make it. Only one of them quoted on it. Its not sensible, or even possible for a buyer to get involved and to make things better instead of worse, is it?

VA. The buyer has a simple, practical, powerful tool that is not necessarily used by anyone else — paying ~~out~~ money only for wanted function. Have you placed the order for the shafts?

Buyer. No, I'm working out details of shipment, but I must order them now.

VALUE ANALYST SHOWS HOW THE FUNCTION APPROACH CAN BE APPLIED TO THE BIG JOBS

VA. The "Function" approach works just as well where the real money is, as elsewhere. Let's use it while buying the shaft. Always the first thought is, what function does it provide? We know that it mounts and supports the alternator windings and connects them to the waterwheel. There are two function studies that often help. The first is "Particle" function study. We raise the question, "Exactly what function is each particle of material performing?" The answer obviously is one or both of two functions — resist deflection and/or transmit torque.

Buyer. OK, now what?

"PARTICLE FUNCTION" IS INTRODUCED

VA. We know that since we buy it by weight, we are paying for every particle of steel everywhere in the shaft. Is ~~each particle~~ ^{each particle} either transmitting torque or resisting deflection?

Buyer. No, obviously those particles in the exact center neither resist deflection nor transmit much torque, the stiffness and the "turning strength" are provided by the outer portions of the shaft. As a matter of fact there is a 6" dia. hole through the center. Its put there so x-ray equipment can be pushed through to detect any flaws in the steel. VA. Good, but why is the hole only 6" dia.? Did the engineers believe the remaining center steel was functioning usefully?

Buyer. I'll find out.

He phoned. He was told that the hole was kept ~~as small as would allow the passage of the test equipment, in order to minimize the amount of machining, and thus the cost of machining out the hole, and that the steel in the center didn't contribute useful function anyhow.~~ He said that ~~from~~ ^{for} ~~a viewpoint of performance~~ the hole could as well be larger.

VA. He's told us what we suspected, that we're buying, and transporting and handling a lot of steel that isn't doing us any good. Now let's ask him to give it a technical check and see how much we could remove from the center without effecting performance or safety ~~factors~~. A 1' dia. hole would take out 4 times as much steel as a 6" hole. Then we'll know our functional need, and we can discuss getting it with our supplier.

The laboratory reported that ~~performance-wise~~, a 15" diameter hole would be suitable. The buyer requested an alternative quotation based upon the 15" diameter center hole instead of the 6" diameter. He was astonished when the quotation was the same identical cost per lb. The vendor said that "it makes no difference to us the size of the hole. We take it out in one cut by trepanning anyhow".

The buyer had, on the large involved item, ~~by using the think function and~~ by function technique, ~~already~~ removed tens of thousands of dollars of "un-functioning" cost. Meanwhile discussions of the second function study were proceeding. ~~They will now be reported.~~

"SPECIFICATION FUNCTION ANALYSIS" IS INTRODUCED

VA. The 2nd very productive function study technique you'll always want to use is called "Specification Function Analysis". Let's try it on the shaft. We know that drawings and specifications are to tell the supplier what to provide and to make sure they will function when received. Many are basic, while many, in different ways make the material more costly for the supplier, and thus for us. Some specific specifications cause ~~specific~~ increases in cost, and presumably bring some specific function which would not be assured without that cost. This study identifies exactly what added function is provided and relates it to exactly how much cost is added by it. On the flanged shaft, ask the supplier what tolerances are adding cost, and how much is added.

Buyer. There is no cost added by any tolerance specification, as a matter of fact, we buy it rough machined. It is just a straight round 3' diameter bar of steel, with a flange on the end — and of course the hole through the center.

VA. Good, but I wonder if we're buying any substantial amount of particles of steel which will become non-functioning, on the outside of the bar, because they are machined off. Let's look at the drawing of the finish machined shaft.

This showed long sections that were machined down several inches, leaving flanges and shoulders for ~~specific~~ part mounting.

Buyer. They rough machine to within $\frac{1}{2}$ " dimension. I'll get a rough sketch of the shaft allowing $\frac{1}{2}$ " over the finished size overall, and see if that would increase the cost of the rough machining.

The vendor stated that turning the outside of the shaft to the desired contour, as long as the $\frac{1}{2}$ " tolerance remained, posed no problem, and the price per lb. would remain the same. As the result of the buyers function thinking and work, a new drawing was made which showed contours needed. Each 1000 lbs. off saved \$1,000, also freight and in-house machining.

BUYERS UNDERSTANDING OF THE "PARTICLE FUNCTION" AND "SPECIFICATION FUNCTION" ANALYSIS APPROACH GIVES HIM THE TOOL TO USE ON OTHER PROJECTS, WITH GREAT SAVINGS

The buyer said, "Now you're getting me excited about this 'Buying Function', do you suppose we

can do anything about that monster six foot diameter flange on the end of the shaft"? The VA said, "you try it, you're getting the knack of it".

The buyer ~~explained the effectiveness of his approaches of particle function analysis and specification function analysis already used on the shaft and~~ started ~~similar~~ function questioning of the enormous flange. He was at once told, "No dimension or tolerance of the flange can be changed in the slightest. A committee of our people and the waterwheel supplier worked it out and all agreed to adhere to it 100%. As a result, we have never had any problems of waterwheel and shaft flange fit".

Next stop was the waterwheel supplier's plant. "We question that all particles of steel in that large flange are working when we get the waterwheel securely bolted to it", the buyer told them. Then he explained the particle and specification function study approach. As the thinking developed, they said that they felt there was non-functioning steel there, and to match it they had to put non-functioning steel in the mounting flange of the waterwheel. They said that they were just as interested as anyone to reduce non-functioning weight and cost, they would work out their thoughts and be in touch.

The result was that the joint committee established new dimensions reducing the flange diameter from six feet to five ending more thousands of pounds of weight and dollars of cost. The buyer was ~~already~~ competent to achieve results "on his own". ~~now~~

WHAT DOES THIS STORY SAY?

It says that with only modest effort the Value Analyst can equip his buyers to bring tremendous benefits using simple VA methods. *Do It.*

The ten Value Analysis principles for buyers was clearly set out in my paper printed in the 1979 SAVE Proceedings. Review these principles in your Proceedings or secure a reprint from the National Business Office.

TEN FUNCTION ANALYSIS SYSTEMS TO TEACH YOUR BUYER

1. Purchasing Particle Function Analysis.
2. Purchasing Specification Function Analysis.
3. Purchasing Part Function Analysis.
4. Purchasing Aesthetic Function Analysis.
5. Additional Cost Function Analysis.
6. Supplier Manufacturing Cost Function Analysis.
7. Functioning Produce Function Analysis.
8. Supplier Manufacturing Process Function Analysis.
9. Non-working Cost Function Analysis.
10. Combinations of the Above, such as 1 & 2 or 2 & 9, etc.