

第5回 VE全国大会・記念講演

# V E の 発 展

～ 企業競争に勝つための思考システム ～

1972.10.24

東京商工会議所

ローレンス・D・マイルズ

日 本 V E 協 会

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・ チェサピーク湾のわが家	
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・ 米国が見習うべき日本製品の品質	
・ 私が皆さんから教えられたこと	
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・ 早くも現れた可能性や社長がそこで決めたこと	
・ 二つの結果：①システム思考の効果 ②企業競争力への利益	
" チャンピオンはコーチの受け方からしてちがう "	
・ 変化への抵抗感：肉体も心も変化をきらう。そこで切りかえを。	
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・ " 思考のシステム " とは	

“各人が自分のアタマで考えて、よりよい結果を得るための筋道(Procedure).”

“頭を使う”のは必要性(ニーズ)によるものではないのか。

問題がきびしく、緊急であれば頭をフルに使うのではないか

— そのとおり、フルに使うが、効果性は最大ではない。

きびしい問題はどこでもある。それで成果をあげることができれば、自然にそう展開できないか。

・新しい角度 — “心の波長を合わせること”

(a) 拙著“価値分析の進め方”参照

## V. “心の波長を合わせる”とは? ..... 7

まず自問自答 — 皆が正確に同一問題に波長を合わせる —

- ・そうすれば効果が100%あげられるか
- ・考える仕事をうまくやってきた人間に考え方を教えるのか
- ・考え方の“種類” — まず“情報思考”を

### <1> 情報思考について

情報をつくるのは“仮定条件”をへらし、しかも改善するため

“情報”に含まれるもの ..... 8

まだ問題は解決されていない。そこで“分析思考”を。

### <2> 分析思考について

- ・解決案もそろってないときに“分析思考”がはじめられるか……そこで“機能思考”が大切
- ・機能の評価……
- ・さて“問題の設定”はどうなるか
- ・問題の設定：当初の問題と“設定した問題”のちがい ..... 9

## 事例：冷ぞう庫設計上の問題点

当初の問題：高度品質で低コストの低温コントロール・リレーをつくること……9ドル

設定された問題：機能別に .....	} 合計 5ドル
温度の感知は .....	
接点の作動は .....	
回路の遮断は .....	
調整のはたらきは .....	
取付・保護は .....	
美的アピールは .....	

・これは、「一つの問題を六つの問題に別けた」みたい。

### <3> 創造思考

・そこで“創造思考”にうつる……判断思考はやめて思考の飛躍を……“VA”も“創造思考”もまだまだフルに使われていない。

アインシュタイン曰く「問題を解くには、論理よりも創造性の方が大切」

・“創造思考”の「最終産物」は何か。

具体的な解決アプローチのリスト

### <4> 判断思考 ..... 10

・解決アプローチのリストにばかばかしいアイデアはない。

判断思考の真髄は

- (イ) ニーズ以上のアプローチを見つけること
- (ロ) アプローチの欠点を最小にすること
- (ハ) アプローチの長所を最大限に伸ばすこと

## VI. "体系的思考"の4形態を具現する事例

### セメント工場の例

この場合の"思考の波長合わせ(同調)"の所要時間

- この例の場合の"具体的思考"
- この例の"思考"の目的 ..... 11
- 情報の展開とよりよい仮説

### セメント工場での具体的成果

- 全面的解決への今一步の"思考"を  
"分析思考"の実際  
"創造思考" // ..... 12  
"判断思考" //

## VII. サイロにダクト・システムを取りつける事例

- 四段思考をあてはめて
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- "四段思考"法の修得と適用 — 日本でも
  1. 経営者・管理者はコンサルタントを善用して製品／サービスの経済生産性を向上
  2. 大学は上級／専門レベルの教育
  3. コンサルティング団体，大学は経営者・専門家へのセミナー
  4. VE協会的活動

## VIII. む す び

- 皆さんは一人一人が向上を求めて大会に参加された。一人一人が企業競争の勝者，チャンピオン……
- 思考システムの適用により必ずや絶大な成果を……

・最後に、3つの目標をおすすめして話しのむすびとしたい。

“今すぐ、思考の切りかえで、これから10%の成果向上にとりかかろう”

“思考速度を加速的に高めて、1年後には25%の成果向上を実現しよう”

・かくして、“正しく考える者は必ず勝てる”のである。

# IMPROVING VALUE ENGINEERING --

## THE THINKING SYSTEM OF CHAMPIONS

By L.D.Miles

If you were to visit my wife Eleanor and I, and I hope some of you will, you'd find a hundred year old home with a "Larry and Eleanor made" patio five meters from the waters edge. Large trees tower over the house, excepting in front of the sun living-room where you would be sitting, having tea, and enjoying the view of the living water and the green shores of a tributary of the beautiful Chesepeake Bay.

### YOUR PRODUCTS ENRICH OUR LIVES

Your tea would be served in a tea set Made in Japan. You would listen to background melodies from a fine radio Made in Japan. You would visually examine nature drammas on the water and along the shore with binoculars Made in Japan.

Soon you would move to near the water's edge, on the patio, where, since Eleanor loves to cook for fine friends, you would enjoy gourmet foon from dishes Made in Japan. It would 'nt be long until your pictures in this beautiful setting, would be taken on a camera Made in Japan. Then, alas, if you were unlucky enough to stumble on a brick and tear your clothing, you would wait for the repair in my den with a real friend of mine, to whom I have become greatly attached - my typewriter, on which I wrote my recent book, and this paper, Made in Japan. Meanwhile Eleanor would mend the clothing, on a sewing machine Made in Japan.

### YOUR QUALITY SETS AN EXAMPLE FOR ALL OF US

We are here today to honor a great people who have made the words "Made in Japan" mean to us "Good Quality". This has happened because in a thousand different places throughout Japan a million separate actions on "how to do it" were decided in favor of keeping quality. I honor those people who made those decisions. I know it was 'nt that simple. Thinking effectively enough to keep quality, still meet competitive costs, is a master task. Triple honor to those thousands throught Japan who said, "No, think it through better", "No, think it through better", "No, think it through better".

And more honor to those throughout Japan who have, as a result learned to always think better and better and better. To your very great credit, you have changed the meaning communicated to the American people, and I'm sure to the rest of the world as well, by the words "Made in Japan". They originally meant to us "Not made in America". Now they mean to us "Good Quality". And to me, they mean, "Good Quality", because of "Good Thinking".

I was greatly honored by the people of Japan ten years ago. Of all nations, you were first to understand the improvement in thinking caused by the Value Analysis system, and to translate my book, first edition, into your language. By now, ten years later, six other nations have followed the lead of Japan.

YOU TAUGHT ME A LESSON

You taught me a lesson. It has changed my teaching approach. Ten years ago I believed that because the hungry man most wants food, and the cold, naked man most wants clothing, those people most struggling and distressed because of the lack of superior thinking would most want improvements in the thinking system. Not so! I learned that, only the gourmet appreciates superior food. Only the winner wants coaching, to become a champion.

I am honored today to be in the company of winners and champions. I have observed, from across the Pacific, some of the severe problems which, from time to time, rise and confront you. I have observed also your enormous ability to realistically resolve these situations into their basic facts, then to think, and act, and to solve them.

In my own country my pathway has been marked by exciting experiences of great good to large numbers of people because good thinkers - winners - decided to further improve their thinking system - become champions. I'll tell you about a few. I'll include enough details so that the methods they used will communicate.

SAID THE COMPANY PRESIDENT " I'M DESPARATE "

A few years ago a company president came to see me. It was January. He said, "I'm desparate. I make and sell a group of products essential in the electric utility industry. \$4,000,000 per year. I have kept high quality, and 1/3 of the available market. I have good cost reduction work, and maintain net earnings around 11%. Suddenly, my competition is taking orders for October delivery, at 25% lower prices. It's disaster! I lose my earnings or my share of the market. What do I do? Can your system help?"

By the next day's end, we were in his plant and had a plan which did, in fact, bring continued employment to all of his people, save his earnings and save his market. He later showed me a report to his board of directors which told them that he had met competition, lowered his selling prices 25%, achieved the lower costs by October, kept his volume at 1/3 of the market, and raised his earnings from 11% to 12%, with no reductions in quality.

How did he do it? By better thinking followed by proper action.

The better thinking was done by his own people, guided in techniques of better thinking.

An environment for better thinking was created.

The product was functionally grouped, men were divided into thinking groups, time for the thinking activity was set at 4-five day weeks. Training in the Value Analysis techniques of better thinking was provided to all from 8 to 10 in the morning for the first two weeks.

These arrangements were accomplished by:

1. Freeing the engineering manager of other work for six months, putting him in complete charge,
2. In a room 10 x 20 meters, set up four tables for thinking groups, and facilities for instruction.
3. Divide the product basically according to component function, not component. Electro-magnetic functions were assigned to one table. All controls were assigned to another. Enclosure support and protection functions to another, and all purchasing to another.
4. In each thinking group consisting of three, was a responsible knowledgeable engineer as leader. The purchasing head was leader of the purchasing table. The second member was a specialist from within the company with expertise in the type of functions being studied. Getting the third member was not so simple. Time was of the essence. Masterful thinking must start now, not, after the men had learned. The president knew some other companies, not his competitors, who had Value Engineers. He "borrowed" one trained and skilled engineer for each table group, for 4 weeks.

Now, 1. with the environment right for superior thinking,  
2. with the product functionally divided, and all problems stated in functional terms,  
3. with men in each group skilled in better thinking, and with all members progressively learning the approaches,  
4. with knowledgeable people who have clear instructions in charge of each group,  
good potential improvements came fast. In fact, accomplishments ran so high that the enthusiasm in the group was tremendous.

The president, among other arrangements announced that:

1. When the 4 weeks study ended, the four group leaders would be assigned for the next 8 weeks to lead and be responsible for implementation of the results from the thinking at their tables.
2. All shipments beginning in October would use the new approaches.
3. New approaches were to be reduced to practice in the longer lead-time sub components first,
4. Purchasing will not order materials for any production items which will be shipped in October or later, which have not used the changes approved, without his own written approval on each item.

Thus ends the story, showing us two great truths:

1. the astounding effectiveness of thinking when a complete system is properly used,
  2. the large benefits to a competitive business, when, even a little disciplined thinking is used. (Relatively few people, for a relatively short time).
- It shows "How a winner receives coaching and becomes a champion".

Probably one reason it is so profitable to improve thinking patterns is that it is so resisted, and therefore, so seldom accomplished. We resist changes to the mind just as we would resist changes to an arm or a leg. If an arm could be made two feet longer, we wouldn't want it. We don't like to change ourselves. We are comfortable with ourselves the way we are.

"LEAVE MY ARM AND MY MIND ALONE"

An interesting example of this saved a company \$22,000./year.

It was a highly successful company in Europe.

The product was electric motors, 1 to 10 horsepower.

They were well designed and almost completely automated.

The president told his managers that good performance must be provided for progressively lower manufacturing cost, or future markets could not be kept or won.

The motors were already so superior, and so much money was already invested in tooling, that they told him it could 'nt be done.

He called me. We scheduled two weeks of study and training.

For their convenience, we scheduled one week, recessed two weeks then finished.

It was in English. All knew some English. Some knew and spoke it very well.

To provide best understanding to them, I requested that they have all discussions in their native tongue.

Unknown to me, there was much negative from some of the technical management attendees during the first week.

As we started the second week my advisor told me this. I arranged for him to interpret every negative statement to me, so that my help could specifically fit the need.

The product manager, who was the highest ranking man, stood up and talked for about five minutes. Then my advisor interrupted, saying, Larry, he said that he and some of his associates don't believe that this big 'thinking system' is needed, and to prove it, during the two weeks recess, three of them studied the terminal on the motor for a few hours, and, without any special thinking processes, made improvements, which are already approved. The drawings are being changed. \$22,000 per year was saved".

What is your interpretation of that example?

I glowed inwardly with pride that, for whatever reason, I had caused them to think, and that their thinking had been so profitable. Afterwards, one told me that they did use part of the thinking system. Of course, what I never could tell them was, "Congratulations, you have proved my point, you used a part of the system for a few hours and increased your company's earnings more than \$1000. per year per man-hour of thinking". That would embarrass competent responsible people, and above all else ~~that~~ must not be allowed to happen.  
embarrassment

## THE MAKING OF A CHAMPION

Perhaps the greatest thrills came from seeing the almost miraculous growth and development in men. Close to a thousand have told me that it doubled their ability. One young man came for three weeks of training. He was age 23. He worked in Industrial Engineering in the factory. He had no formal education beyond high school. He had taken the short courses that were available in the factory in Industrial Engineering subjects.

He was one of a thinking team of three as he learned our techniques. Occasionally I walked by their table. The results they were getting were astounding. He was the youngest and least experienced, but his thinking was clearly leading the group. He was excited by the progress they could make. It was as though, now, for the first time, he had wings and could fly.

I called his manager in the factory saying, "He has ability to help you much more than is possible as you now use him. Give him twice the responsibility now, when he returns. If you don't, you will lose him, and he's superior". He said, "Larry, I appreciate your call, I'll do what I can, but I can't advance him much. He has no technical degree, and others who do have, want and expect the advancements".

What happened? I checked a year later. He had left the company, was manager of Industrial Engineering for a competing company. And what about 5 years later? The Chairman of his board of directors called me, saying, "We have just made Jim our company president".

I wrote him, congratulating him, and mostly in jest, asked, "How much do you think learning Value Analysis increased your competence"? He answered, "500%" ! It had given him the wings that he needed, now he could fly ! He was a winner, now he's a champion.

Before preparing this talk, as I pondered what subjects to include, Eleanor saw my open mind and said, "Larry, you're going to be talking to winners and champions, what are you going to tell them that will make more champions"?

Right then I vowed that somehow, I would tell of some of the newer approaches, and show how they blend into the present ones. I couldn't do it all, so I chose those which help to get better solutions to hard problems through better thinking.

(a)

## THINKING SYSTEM INCLUDING SOME NEWER TECHNIQUES

So that I could be very specific, I asked a professional associate to ask specific questions of me, which I would answer. We did so, using a tape recorder. With a little editing for clarity, the discussion follows.

WHAT IS DIFFERENT ABOUT THE NEWER TECHNIQUES?

They fill needs in the present system, often get better results. Also they fit the system to administrative, management, service, process and software type of problems.

HOW DO THEY AUGMENT THE PRESENT VA TECHNIQUE SYSTEM?

They get better answers to problems. They get more Disciplined Thinking on the right problem and in less time. They "set" the problems to be solved, precisely--and "tune" the minds working on them to that precise task. They provide an effective thinking system.

"THINKING SYSTEM" --WHAT DO YOU MEAN BY THAT?

A procedure that allows each one to get better results by the use of his own head.

DOESN'T EFFECTIVENESS IN THE "USE OF THE HEAD" DEPEND UPON THE INTENSITY OF THE NEED? IF THE PROBLEM IS INTENSE, DESPERATE AND IMMEDIATE, DOESN'T IT AUTOMATICALLY CAUSE MAXIMUM "USE OF THE HEAD"?

Maximum use, but not maximum effectiveness.

PEOPLE HAVE ALWAYS HAD PROBLEMS SERIOUS TO THEM. IF THIS GETS BETTER RESULTS, WHY DIDN'T IT DEVELOP NATURALLY?

It has. Near the beginning of mans history, he survived mainly by the use of brawn. As centuries passed, this changed. It depended on the combination of brain with brawn. Today, this trend toward dependence more upon the contribution of the brain continues, at an accelerated rate. This system for securing better results per brain-hour is a normal and timely development.

WHAT'S NEW?

For one thing "Mind-tuning".

(a) Some material is from "Techniques of Value Analysis and Engineering, 2nd Edition", 1972, Miles, McGraw-Hill Book Co.

WHAT DO YOU MEAN BY "MIND-TUNING"?

Before any mental time and effort are used on a problem-- a period of self-questioning is necessary. "Exactly what am I trying to do"? As in tuning a radio, this ends fuzziness, makes the task crisp, precisely defined, in harmony with my wishes, states it in my words, lays out exactly my area for effective mental work. When more than one work on a problem in addition, it gets all minds to work on exactly the same problem, so that the outputs of all minds fit together in a useful pattern like a jig-saw puzzle. Without "Mind-tuning", for all of a group, the results of their mental work mis-match somewhat, as would parts brought by each from a slightly different jig-saw puzzle.

WOULD YOU SAY THAT THIS MIGHT ADD 10% TO THE EFFECTIVENESS?

I've seen it add entire new problem solutions, change the whole direction of mental work, add 100% to effectiveness. I'll give an example later that will show what I mean.

IT DOESN'T SEEM TO ME THAT MEN WHO HAVE BEEN SUCCESSFUL IN THINKING WORK ALL OF THEIR LIVES NEED TO BE TAUGHT HOW TO THINK.

The game of the man who has played golf all of his life benefits by more teaching. Thinking, like golf, is goal-oriented. It's important to achieve results. Results from any mind are increased as each kind of thinking is done completely--and, in its proper sequence.

WHAT "KINDS" OF THINKING DO YOU MEAN?

The first of four separate kinds is (1) "Information thinking, or, information searching, information developing, or growing". The quality of total thinking can never exceed the quality and completeness of information.

WHAT'S NEW ABOUT THAT? THINKING PEOPLE HAVE ALWAYS GOTTEN THE FACTS ABOUT A SITUATION BEFORE STARTING THEIR SOLUTION-ORIENTED THINKING.

It's a matter of degree and of total separation. People also have always "thought". We're talking about achieving much better results from "thought", maybe 10% more, maybe 100% more. Since the ceiling on results from all subsequent thinking is placed by the quality of the information, "try harder", stick to information searching longer, dig deeper, creatively develop more facts, and better assumptions.

ASSUMPTIONS? DON'T WE DEVELOP INFORMATION TO ELIMINATE ASSUMPTIONS?

Yes, or, rather, to minimize assumptions. There will always remain some assumptions. But, sharply separate assumptions

from facts. We call it "improving" the assumptions. Better information development identifies some assumptions as false and ends them. It identifies some as truth, and changes them to facts. In this type of thinking, after identifying and improving the assumptions, think intensely along the following lines: What new assumptions (which are probably true) would allow later thinking to be faster propelled toward superior solutions? Make such new assumptions, then constantly thereafter be alert to "improve" them with more facts.

JUST WHAT DO YOU INCLUDE IN "INFORMATION"?

Knowledge about everything related or possibly related to the situation which exists or may exist.

ALL OF THIS, AND WE HAVEN'T YET GIVEN ONE THOUGHT TO THE PROBLEMS SOLUTION?

Right! Now we'll change to a second kind of thinking---  
(2) "Analysis" thinking, see what kind of a problem we have, decide what solution we want to achieve and "Set the Problem", in practical, solvable terms. We're not trying to look good on the playing field, we're going to make a good final score.

HOW DO WE START THIS "ANALYSIS KIND OF THINKING, BEFORE WE EVEN HAVE DIFFERENT POSSIBLE SOLUTIONS TO CONSIDER?

Now extensive essential "function" thinking is developed. What does the customer or user really need and/or want, precisely? Functions are separated for single study, then are grouped as needed for best solution. Single functions, and often grouped functions are evaluated.

EVALUATED? WHAT DO YOU MEAN BY THAT?

Based upon the information at hand, the probable avenues for improvement, comparisons to the cost of producing similar functions, and the extent of the real need, a figure of appropriate cost is assigned to each function, and/or to each group of functions. This is the cost which it makes sense to believe that the function or functions will be secured for after a reasonable amount of Disciplined Thinking.

BUT YOU STILL HAVEN'T "SET THE PROBLEM"?

After we develop a few more answers we will. What are the meanings? What are the total problems? The individual problems? The reasonable goals and plans? What are the key problems to be solved first? What solutions seem reasonable? What end result is reasonable? What steps--first, second, third, are indicated? What additional information is required? What unlisted assumptions are being made? Are the assumptions now valid? What solutions does it make sense to search for? Approximately what savings or benefits might each of the best approaches bring? Exactly what parts of the problem or overall problems should we seek out better solutions for first? What specific needs, when well met by better solutions, would "unlock" very beneficial solutions for the project?

Now the problem can be established or "Set".

WHAT'S THE DIFFERENCE BETWEEN THE PROBLEM WE HAD AT FIRST AND THE PROBLEM WE HAVE "SET" NOW?

Let's take an example. As competition increased it became necessary to think more effectively in domestic refrigerator design. The original problem was: "We need a cold control relay, still with high quality, but for much less than its present \$9.00 cost". As a problem is set it is put into function terms ready for the Creativity type of thinking which will follow immediately. Also, the functions are divided, or grouped so that each unit becomes a "thinking package". Now the problem is stated:

How might we sense temperature for	\$ .60
How might we actuate contacts for	.80
How might we interrupt current for	.50
How might we provide adjustment for	1.00
How might we mount and protect for	2.00
How might we please the customer (aesthetics)	.10
Total-----	\$5.00

Now, you see, the original problem has become a series of very specific problems, all in functional language, each solvable in its own parameters, with a total that meets the needs of the business, \$5.00 cost instead of the \$9.00.

WE HAD ONE PROBLEM BEFORE, NOW WE HAVE SIX PROBLEMS, IS THAT PROGRESS?

Yes.

SO NOW WE CHANGE OUR THINKING TO THE THIRD TYPE (3) "CREATIVE"?

Yes. All judgement thinking is temporarily withheld. The minds must be sparked to "roll free", making associations they never have made before. No person must be present who is not sufficiently disciplined to withhold judgement thinking. This creative thinking can be, and must be effectively done to provide suitable directions for the next type of thinking.

CREATIVE THINKING, PER SE, HAS BEEN AROUND A LONG TIME, HASN'T IT?

No. About the same as Value Analysis. The late Alex Osborn got it well started. Others have added since. Anyhow it can be well learned from existing publications and courses, and must be mastered by anyone who hopes to compete in problem solving in a competitive field. It is a vital, indispensable step in effective Disciplined Thinking. Einstein said, "When there is a problem to be solved, Creativity is more important than Logic".

WHAT IS THE "END PRODUCT" OF THIS CREATIVE THINKING ON A PROBLEM?

A long list of approaches, which fit the specific "How Might We"--- statements of the problem. Properly completed, these stretch the mind, and the imagination still further. In this listing should be found some approaches which will meet the needs of the problem.

THAT'S THREE KINDS OF THINKING, WHAT'S THE FOURTH?

(4) "Judgement" type thinking, as opposite from creative as north is from south. Now the task is to sort out one or more approaches to the problem solution, from this list.

NOW YOU GO THROUGH THE LIST SCRATCHING OUT THE IDEAS THAT ARE RIDICULOUS OR WORTHLESS?

Absolutely not. An approach may, at first blush, appear ridiculous. But it may not be at all. It may be that the way we, at the moment, are thinking of using that approach, is what is ridiculous. Real Judgement thinking--which is selecting, minimizing disadvantages, and maximizing advantages, will change that approach to a winner. The real essence of Judgement thinking, is (1) selecting an approach which would (when improved and developed and extended) meet or exceed the present need, (2) Minimizing the disadvantages of that approach, and (3) Maximizing the advantages of it.

CAN YOU TIE ALL OF THIS "DISCIPLINED THINKING" TOGETHER IN A FAIRLY SIMPLE EXAMPLE?

I believe so. I'll cut 4 hours work to 3 minutes, only hitting the high spots.

"The plant engineer of a cement plant received instruction from company headquarters to put a dust collector on top of a group of 6 silos. He, with two associates, started the design, preparing to secure bids, buy it and have it installed. Preliminary figures showed that it would cost about \$40,000.00".

Engineering management at that moment, by accident, appeared on the scene and said, "We have a consultant here for today who believes his Disciplined Thinking System might help our operation, let's select any one of your problems and see how it works". They selected the above program.

IN THIS CASE THEIR MINDS WERE NO DOUBT ALREADY TUNED TO THE SAME PROBLEM?

Yes, but the wrong problem. But first note how much time was used in each type of thinking.

Mind setting	45 mins.
Information thinking and Assumptions improvement	2 hrs.
Analysis thinking	30 mins.
Creative thinking	30 mins.
Judgement thinking	15 mins.

WHAT DID THEY "THINK THEY WERE TRYING TO DO" ?

"Economically and efficiently design and buy a dust collector and have it installed". Their instructions were clear. It took

45 minutes of hard "leading" to allow them to clear their minds and re-tune.

WHAT FINALLY, "WERE THEY TRYING TO DO"?

"Assist in operating a profitable competitive business".  
Then specifically, "to minimize or end dust".

THEN THEY PROCEEDED TO INFORMATION DEVELOPMENT AND ASSUMPTIONS  
IMPROVEMENT?

Yes. In the two hours of (1) "Information" thinking, much information was brought to the surface. A few items which were quite pertinent are:

There was not always dust

There was dust when a silo ran over

There was dust when the very bottom cement was being  
taken from the silo

Cement flow is caused by 30 lb. air infusion at silo base

There was dust when the 150 lb. air pressure line was used  
instead of the 30 lb., to cause cement to flow

The 150 lb. line was often used when the 30lb. line was not  
functioning

Between the compressor and the silos was a low place where the  
30lb. line went under the road. Too frequently water, rust and  
other contamination collected there, clogging it

Dust drops out of a stream of air whenever the cross section  
of the duct is increased (therefore velocity decreases)

Some of the silos were always partly empty

While the exact formulation of the cement in various silos  
often differed, differences were so slight that dust from  
any one would not contaminate any other

It costs \$1,000. per year to clean up around the silos

Another \$1,000. per year of cement is wasted.

Probably 10 times this much information was developed. However,  
these listed here are useful information "bits".

IT SEEMS TO ME THAT SOME OF THE SOLUTIONS ARE OBVIOUS NOW,  
WITHOUT GOING INTO MORE DISCIPLINED THINKING?

Partly true, but we don't want a part solution, we want a full  
solution. Always thorough work in Mind Tuning is essential, else  
we might be working on the wrong problem, or differing problems.  
Often thorough work in Information Thinking so illuminates the  
problem that good work in the remaining thinking steps, proceeds  
very fast, and very effectively.

PROCEED WITH THE (2) "ANALYSIS" THINKING.

Now we decide: What are the meanings? What solution do we  
want? What specific problems shall we solve?

We want a good business solution if possible, then will go  
beyond if desirable to meet ecological needs.

Possible saving is \$2,000. per year  
Company practice is to liquidate expenditures in 2 yrs  
This means maximum expenditure of \$4,000.  
Basic problem then is "End this dust with \$4,000. expenditure"  
The various causes for the dust were discussed, providing  
direction for further thinking  
For the Creative Thinking to follow the problem was set:  
"How might we reduce dust?"

WHY NOT BE COMPLETE ABOUT IT AND USE "HOW MIGHT WE END DUST"?

Ending dust requires judgement. Now we want creativity. Minds will roll much freer on the subject of "reducing" than of "ending". Then later judgement can put together a package that ends it.  
(3) Creative thinking followed. A few of the most pertinent of the dozens of approaches listed, are noted here:

Stop running over the silos  
Move the 150 lb. line so it will not reach the silos  
Clean out the 30 lb. line  
Reroute the 30 lb. line overhead, so it won't stop up.

IT SEEMS TO ME THERE ARE SOME VERY GOOD SUGGESTIONS HERE.

Wait ! You are already judging. Do a thorough job of creating before you start judging, or you miss some very good solutions.  
Now to finish creativity:

Vent the emptying silo through the top of a part empty one  
Vent the silo being filled through the top of a part empty one  
Now we are ready for judgement thinking.

NOW LET ME DO THE (4) "JUDGEMENT" THINKING FOR YOU, AND SEE HOW IT MATCHES THE WORK OF THE ENGINEERS.

Alright, but first lets review. Judgement thinking is selecting the best approaches, then minimizing their disadvantages, keeping at it until the needs of the problem are fully satisfied.

MOVE THE 30 LB. LINE OVERHEAD. MOVE THE 150 LB. LINE AWAY. PUT A DUCT SYSTEM OVER THE SILOS.

Good, now note how eager you were to judge. Everyone wants to judge. Some will start judging during (1) "Information" Thinking, and again during (2) "Analysis", and again during (3) "Creativity". To become a disciplined thinker, and develop the really good problem solutions requires real mental discipline and mind training.

Now lets finish the (4) "Judgement" Thinking. To re-route the 30 lb. line overhead, and to move the 150 lb. line would cost about \$2,000. To build a ducting above the silos in such manner that if a dust collector were later installed, it would fit right on, would cost another \$2,000. The dust is now substantially, if not completely

eliminated and the cost is \$4,000., which is only twice the annual cash saving. In conclusion, the expenditure will now be \$4,000., instead of the planned \$40,000. The thinking task was well done.

YOU'VE MADE A CASE FOR DISCIPLINED THINKING ALRIGHT, NOW HOW DO YOU PROPOSE TO GET IT LEARNED AND USED?

Four ways.

1. By consultants helping management and administrators produce more services or product per dollar.
2. By Universities teaching to advanced students and special groups.
3. By seminars taught to professional, administrative and management people by consulting firms and Universities.
4. By activities of S. J. V. E.

## CONCLUSION

I know you have each come to this conference for improvement. I know you have learned good knowledge and good methods from your SJVE sessions. I know that each of you is a winner, or you would not be here.

I know also that when you persist in using this thinking system on one of your most difficult problems, you will be surprised by what is accomplished.

May I suggest that each of you consciously set goals for yourselves as follows:

"I will begin at once getting 10% more good results from my thinking".

"I will progressively increase my skill in thinking, so that a year from now, I will be producing 25% more good results".

You will often, then, feel the great satisfaction that comes to a champion.

END