Activity Versus Accomplishment
New Challenges for Quality Control Managers
That's what the new PERFORMANCE IMPROVEMENT HANDBOOK is about. Better job performance means better products and services at less cost. Eleven executives from the country's top industrial companies tell how to get profitable results. They've done it. So can you. They explain how to put the theory into practice. The System works for a two-man hot dog stand as well as a big, multi-product manufacturing complex. They say a prevented defect doesn't need repair, examination, replacement or explanation. Covers: Quality Costs; Measurement and Data Collection; Planning; Evaluation; Training; Error Cause Removal; Recognition of Employee Effort; Quality Concepts; and much more.

PERFORMANCE IMPROVEMENT HANDBOOK is published under the auspices of the American Society For Performance Improvement. Money back guarantee if not satisfied. PERFORMANCE IMPROVEMENT HANDBOOK and a one-year subscription to PERFORMANCE Magazine (six issues) only $14.50.
Take it from an expert... 
Owning a Frederic Remington treasure is like owning stock in America.

This sterling silver salver could well be the wisest investment you ever made.

My name is Reese Palley and it's my business to know fine art. For over 20 years now, I've been selecting accretive objects for a small circle of clients and friends. The objects I have selected have consistently gone up in price and have become rare and scarce. I have often right more times about objects art than I could have been expected to.

Collectors trust me to find those American artists whose creations will be in demand and whose future value will exceed their present cost.

This beautiful Remington salver is my latest "find". It meets, and even exceeds, the criteria I use in evaluating an object's present and future worth. It is distinctive. Exclusive. An example of fine contemporary workmanship. The work of a truly great artist. It will delight your eye and sensibilities.

I have recommended the Remington salver to clients as one of the year's best investments.

Time has proven that there is no more important artist in American history than Frederic Remington. His works are today commanding prices in excess of 6 figures. His sculptures and paintings define the spirit of the early American West as no other artist ever has. Remington's animated portrayals of horses set a new trend in art. He was the first to make these spirited creatures appear as lithe, flexible, and alive in his works as they are in nature.

The Remington salver as an art treasure

I think this is perhaps the first serious work of contemporary art to be minted in the form of a silver salver.

The workmanship that has gone into accurately replicating the Remington sculpture is impeccable. The image is struck in high bas relief at the center, flaring out in the shape of a gold mining pan. This is no ordinary work. The salver is big—a full 10 inches in diameter. And it contains 22 ounces of solid sterling silver. The entire work is so perfectly weighted and balanced that you must hold it in your hands to fully appreciate the exquisite workmanship and detail.

Oh, yes, this unique salver is struck on both sides! The reverse shows a composite bust of the artist, his signature and a replication of one of his Indian paintings, "Conquering Back the Buffalo." Truly it is a magnificent, lasting tribute to our American heritage.

Small private edition insures accretion

The salver, produced by the Geo. Washington Mint's Remington's American West Series. It is issued in cooperation with the Whitney Museum of Western Art. Dr. Harold McCracken, the leading curator of the works of Frederic Remington, personally chose the image for this minting. This verified edition, which you can have at the original issue price of just $250, represents a very small price for a fine authentic example of this great artist's work.

All of these considerations lead me to believe that the Remington salver will maintain its value over time and become a repository of value—an heirloom to pass on to future generations.

Now is the time to put money in objects which have demonstrated a record of accretion.

When you stop to consider how little you get for your money these days and how little you have left to show for the money you spend, you must come to the same conclusions that I do... that it is time you put some money in objects which have demonstrated a record of accretion. This is one object that I can almost guarantee. In fact, I am so impressed with its quality—and am so sure you will feel the same way—that I am willing to put this exquisite object in your hands for 15 days. If at the end of that time, you are not fully convinced as I am of the worth of this salver, then I will refund your money.

I suggest you place your order today. The edition is, after all, small—and I know there are a great many collectors who desire it for their fine collections.

Reese Palley
INcORPORATED
1911 The Boardwalk, Atlantic City, N.J. 08401

—FILL IN AND MAIL THIS COUPON TODAY—

Mr. Palley:
I agree with your evaluation of the beautiful Remington salver, and would like it for my collection at the original issue price of $250. I understand that if I am not completely satisfied with it, you will refund my money—in full—within 15 days.

Name __________________________
Address __________________________
City __________________ State ______
Zip ______

Charge to my credit card account: □
American Express # ______
Diner's Club # ______
Bank Americard # ______
Master Charge # ______
Expiration date ______

My check or money order for $250. is enclosed.

Signature __________________________

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EDITORIAL POLICY: PERFORMANCE Magazine umbrellas those performance factors which improve the competitive advantage and excellence of American Consumer/Defense products and services for the markets of the world. PERFORMANCE is dedicated to the effective exchange of innovative technology and ideas as they relate to quality, reliability, safety, maintainability, cost reduction, value engineering, life cycle cost, management improvement, cost-to-produce, standardization, cost engineering, integrated logistics support, defect prevention, suggestion systems, motivation and productivity.

Contributions in the form of articles, photos, letters to the editor, etc., are welcome. Editorial policy dictates the right to edit or reject any material submitted for publication. Views and comments of contributors do not necessarily constitute the endorsement or opinion of the American Society For Performance Improvement, the Society of American Value Engineers, the National Association of Suggestion Systems, nor that of the National Property Management Association.

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DEDICATION TO A CAUSE

Americans have always been noted for becoming completely dedicated to THE CAUSES with which they become involved. Throughout our history, from the Revolutionary War until today, the world has viewed our dedication to “the latest cause” with feelings ranging from fear to amusement (based on the “cause” we were then espousing). The personal dedication and seemingly endless expenditure of resources for “the cause” have been almost unbelievable. Our determination to win our point — to expend any effort to succeed — has marked the continuous improvement of our national status, and our unceasing involvement with the problems of the world.

In each arena of involvement, the size of the dedicated cadre has varied; from the overwhelming percentage of our population in the case of World War II, to the small, but hard-core group of individuals involved in the preservation of our national forestry resources today. In recent history — perhaps, because of the wide-ranging interests of our citizenry — the amount of publicity in both the public and political sectors bears little, if any, direct relationship to the numerical size of the following of the cause, Thus sprung the term, “the silent

Continued on page 31
New from HITCO...

Roto-Disc Valve
U.S. Patent No. 3,424,200

The unique design of the HITCO ROTO-DISC VALVE introduces a refreshing approach to fluid control and provides inherent solutions to many chronic valve problems encountered in fluid control, handling or pipe line transporting.

The ROTO-DISC VALVE features a disc containing custom shaped orifice opening, anti-cavitation ports and circumferential gear teeth for positioning. Choice of the primary orifice shape determines pressure and flow control service characteristics. The anti-cavitation ports direct fluid into what is normally low pressure areas and thereby reduces detrimental cavitation within the valve body.

High energy liquid flow systems are used extensively in the power generating, bulk water, oil and certain heavy manufacturing industries. In many instances cavitation restricts the useful range of operation and impairs the efficiency of the basic hydraulic devices used in these industries. Cavitation damage and erosion can, and often does, cause a need for frequent overhaul and replacement of these expensive devices.

The purpose of the HITCO PRESSURE REDUCER is to repress or eliminate cavitation during energy dissipation in high energy liquid flow systems, and it is believed to represent the first practical device to provide a general solution to this problem.

The 2-inch HITCO system shown at left reduces an upstream pressure of 720 psi to 95 psi. At the maximum flow rate of 1000 GPM the system is dissipating 365 horsepower.

The 8-inch HITCO system shown at right reduces an upstream pressure of 390 psi to 2 psi while flowing 8080 GPM. This system dissipates 1830 horsepower.

For further information regarding PRESSURE REDUCERS or ROTO-DISC VALVES, please direct your inquiries to HITCO, Dept. 73, 1600 W. 135th Street, Gardena, California 90249. Phone (213) 321-8080. TWX: 910-346-6920. Telex: 67-7162

HITCO
A SUBSIDIARY OF ARMCO STEEL CORPORATION
System Components

The HITCO Roto-Disc Valve

Precise, customized flow control – and a dependable solution to chronic valve problems

Only HITCO Roto-Disc Valves offer you the performance and features summarized below:

- Flow characteristics versus shaft rotation can be designed to meet specialized system requirements.
- Valve withstands cavitation with greatly reduced detrimental effects in the housing. (Tests have shown that under cavitating conditions, the major cavitation occurs in the downstream piping.)
- Valve has only one moving part when disc shaft passes directly through housing; only two moving parts when disc is operated by a pinion gear.
- Valve is in line and the Discharge Coefficient at full open approaches that of an equivalent length of straight pipe.
- In full-open position, valve can be line-pigged.
- No fluid displacement within valve body during opening or closing.
- Valve seats are never exposed to dynamic flow of system media.
- Very accurate and repeatable flow control is possible because of high resolution inherent in disc design.
- Valve can be easily fabricated from a wide variety of readily available materials.
- Tear-drop opening in disc can be replaced with multiple round orifices of varying sizes for metering.

Roto-Disc Valves for corrosive media

Because of their design simplicity, Roto-Disc Valves can easily be lined with other metals, such as tantalum, zirconium or nickel, for use with hydrochloric acid, sulphuric acid and other corrosive media. A tantalum-lined valve is available as a HITCO product.

Roto-Disc Valve standard specifications

<table>
<thead>
<tr>
<th>Diameter</th>
<th>1 through 36 inches. Larger sizes upon request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure ratings</td>
<td>ANSI 150 to ANSI 600, depending on size</td>
</tr>
<tr>
<td>Materials</td>
<td>Valve housing: Low carbon steel per ASTM standards, epoxy coated</td>
</tr>
<tr>
<td></td>
<td>Disc and pinion: Stainless steel</td>
</tr>
<tr>
<td></td>
<td>Thrust bearing and valve seats: Bronze</td>
</tr>
<tr>
<td></td>
<td>O-rings: Buna N (NBR)</td>
</tr>
</tbody>
</table>

Flow and cavitation performance data is available for the HITCO valve for all percent valve openings, upstream pressures and valve sizes.

HITCO Pilotry

HITCO-built automatic sensing and regulating systems are available for maintaining constant downstream pressure, whatever the flow demand. The body and poppet of the HITCO Pilot Valve are high pressure rated and are manufactured from stainless steel. Both soft and hard seats are available.

...and the HITCO Pressure Reducer

An inexpensive way to reduce vibration, noise, cavitation and operating costs

Because it effectively eliminates damaging cavitation during energy dissipation, the HITCO Pressure Reducer also significantly reduces both the noise and the vibration normally associated with pressure breaks in high-energy liquid flow systems. Performance is particularly outstanding when the pressure reducer is used in conjunction with the Roto-Disc valve.

The volume of stainless steel and ceramic balls retained in-case between the inlet and outlet ports of the pressure reducer is computer designed to system needs. The customer’s pressure and flow requirements are fed into the computer, which then calculates the exact number and size of the balls for the application. While the design theory is complex, the resulting piece of equipment is appealingly straightforward.

Without moving parts (the balls are vibrated tight into the case), the unit requires virtually no maintenance, and may be buried underground. Moreover, its compactness permits it to be connected serially in the flow line of existing systems.

Noise levels reduced

In tests and actual installations, the HITCO unit has repeatedly demonstrated ability to reduce operation noise levels of 100 to 120 db as much as 20 to 30 db lower than the system it replaced. Accompanying this reduction in sound is a smoother, vibration-free operating system.

Data at design flow from two current installations are presented below:

<table>
<thead>
<tr>
<th>WATER</th>
<th>db</th>
<th>db</th>
</tr>
</thead>
<tbody>
<tr>
<td>$P_u$</td>
<td>$P_d$</td>
<td>$\Delta P$</td>
</tr>
<tr>
<td>740 psi</td>
<td>95 psi</td>
<td>645 psi</td>
</tr>
<tr>
<td>260 psi</td>
<td>2 psi</td>
<td>258 psi</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GASOLINE</th>
<th>76</th>
</tr>
</thead>
<tbody>
<tr>
<td>$200 psi$</td>
<td>$10$</td>
</tr>
</tbody>
</table>

In addition, HITCO has conducted tests on two large autoclaves pressurized with CO$_2$. When dropping from 325 psi to atmosphere during blowdown, the noise is considerable. One of the units registered more than 140 db with no muffling device. The other registered 122 db at a distance of five feet. Attachment of HITCO Pressure Reducers to the ends of the blow-off lines resulted in noise reductions of 30 db.

PERFORMANCE
DOD And SAVE Officials Meet On Design-To-Cost Requirements

Officers of the Society of American Value Engineers recently met with officials in the Department of Defense to determine the positive role value engineering can and should play in Design-to-Cost. Attending this important meeting which could affect the future direction of the SAVE were Leonard Sullivan, principal deputy director of Defense Research and Engineering; Col. Brian D. Ward, his executive assistant; Richard E. Biedenbender, assistant for Value/Cost Engineering, DASD (I&L); and Fred Randall, deputy to Admiral Reich, OASD (I&L). SAVE members attending were C.P. Smith, society president from Vought Aeronautics Co., LTV Aerospace; Bill Dean and Jerry Kaufman of Honeywell Inc.; and Dean Voegtlen, Hughes Aircraft Company.

Significant points are:

VE should be used to develop a functional cost target breakdown. This can be used as a measurement base for design package cost targets developed by responsible design engineers.

VE can be used as a catalyst between the designer and manufacturing to assure face-to-face communication.

VE can assist in the periodic measurement of program cost status vs. target and identify significant cost areas where specific value analysis studies are needed to achieve required cost reduction.

VE can provide leadership in the application of function-worth-cost analysis in establishing reasonable targets and in developing alternatives for high cost areas/items.

VE will operate most effectively as a part of the project engineering or program management office. No new organizations or cults are needed to be responsible to Design-to-Cost requirements.

‘PRODUCT SHOCK’ CONFERENCE THEME

The 4th annual Product Liability Prevention Conference is scheduled for Aug. 22-24 at Newark College of Engineering. It will feature wide-ranging discussions of consumer product safety and product-liability prevention under the theme “Prescription Against Future Product Shock.” For additional information of the conference, contact Martin Post, (212) 225-0880.

GM PAYS $13.9 MILLION FOR IDEAS

GM employee ideas for improving their jobs and better methods of building quality products earned them nearly $14 million in awards during 1972. Stephen H. Fuller, Vice President in charge of the Personnel Administration and Development Staff, recently announced that 616,342 suggestions were submitted by eligible employees and 180,918 were adopted.

Suggestion awards, which range from minimum awards of $15 to the $10,000 maximum awards, were made in nearly all areas of GM operations, including in-plant safety, product safety and product quality improvements, and material and time savings.

TIME WASTING IN THE PLANT

The National Association of Manufacturers took a look at chronic time wasters who haven’t responded to management messages about personal productivity and did a breakdown of an 8-hour day in the average manufacturing firm. Two hours and 19 minutes go for payroll, 3 hours and 55 minutes for materials and supplies, 43 1/2 minutes for taxes, 29 minutes for repair and replacement of facilities, and 14 2/3 minutes for research and promotion. The remaining 19 minutes produce profit, which is split between dividends and reinvestment. Thus NAM says that an employee who wastes 10 minutes, in effect, does it at the expense of funds intended to preserve his job.

The natural beauty of California’s “Port of Gold,” known as San Francisco, will be the setting for “Seminar 73” which will be held 18 through 19 October 1973. The fabulous Jack Tar Hotel, situated in the shadow of the world famous Golden Gate Bridge, has been selected as the location making all of San Francisco easily accessible to attendees and their wives. Burt Crossette, Chief, Contract Property Management Division, DCASR-SF, has been selected as this year’s Seminar Chairman and he solicits any suggestions as to desired topics and speakers from the membership at large. Only topics of interest and benefit to property professionals employed by both large and small companies will be considered.

The seminar this year will not only consist of noteworthy speakers but a property workshop designed to promote technical understanding and individual improvement. The Committee wishes to particularly extend an invitation to the attendees’ wives since daytime activities, including tours, bay cruises, and shopping sprees are being arranged.

Let’s all start making plans and arrangements now to attend “Seminar 73” at the Jack Tar Hotel in San Francisco on 18 and 19 October 1973.

PLANS FOR NPMA “SEMINAR 73” UNDERWAY

The National Property Management Association, NPMA, has been selected as this year’s Seminar Chairman and he solicits any suggestions as to desired topics and speakers from the membership at large. Only topics of interest and benefit to property professionals employed by both large and small companies will be considered.

The seminar this year will not only consist of noteworthy speakers but a property workshop designed to promote technical understanding and individual improvement. The Committee wishes to particularly extend an invitation to the attendees’ wives since daytime activities, including tours, bay cruises, and shopping sprees are being arranged.

Let’s all start making plans and arrangements now to attend “Seminar 73” at the Jack Tar Hotel in San Francisco on 18 and 19 October 1973.
You are important . . .

. . . and facts about your organization are important too! The methods your organization uses to stimulate productivity are valuable, particularly when rising costs and tough markets make increased profitability a difficult venture.

Here is a questionnaire, sent to a sampling of carefully-selected organizations, yours being included. Its purpose is to help determine the incidence and nature of productivity-increasing tools. The results will be analyzed on an industry-by-industry basis. The ultimate objective: assisting in the dissemination of these good techniques plus the development of new ones. Of course, a summary of these results will be made available at no cost to you! Just check the appropriate box and a summary will be yours.

So, right now, while you're thinking about it, please complete the confidential questionnaire form located below. . . it only takes two minutes . . . and drop it in the mail.

We'll certainly appreciate your help in doing so!

Sincerely,

TOWER RESEARCH SERVICE

---

**QUESTIONNAIRE**

*(Please fill in or check as needed)*

**Your name:**

**Title:**

**Name of organization:**

**Number & Street:**

**City, State:**

**Zip:**

1. About how many employees does your organization employ?

- **Total:**
  - ( ) 100-500
  - ( ) 501-1000
  - ( ) 1001-5000
  - ( ) Over 5000

- **At Your location:**
  - ( ) 100-500
  - ( ) 501-1000
  - ( ) 1001-5000
  - ( ) Over 5000

2. What programs does your organization have to increase productivity? (Check all that apply)

- ( ) Supervisory Training
- ( ) Cost Reduction Program
- ( ) Management Development
- ( ) Value Analysis
- ( ) Contests
- ( ) Suggestion System
- ( ) Fringe Benefit Incentives
- ( ) Zero Defects Program
- ( ) Other (Specify)

3. If your organization has a Suggestion System, is it:

- ( ) Very active.
- ( ) Moderately active.
- ( ) Only Fair.
- ( ) Ineffective.

4. If you don't have these programs now, which do you think might be initiated?

- ( ) Zero Defects
- ( ) Cost Reduction
- ( ) Suggestion System
- ( ) Value Analysis

5. When do you think this might come about?

- ( ) 3 months
- ( ) 6 months
- ( ) 1 year
- ( ) 2 years
- ( ) or more

---

**TOWER Fact Summary Form III-Y**

( ) Please send me a copy of the results of this survey at no charge.
Let us introduce NPMA to the many readers of PERFORMANCE who are members of the Society of American Value Engineers, the American Society for Performance Improvement, and the National Association of Suggestion Systems.

The National Property Management Association is an outgrowth of the merger of the PROPERTY ADMINISTRATION ASSOCIATION and the NATIONAL INDUSTRIAL PROPERTY MANAGEMENT ASSOCIATION. This merger was consumated during a meeting of representatives of both associations in March 1970.

The National Property Management Association is divided into three Regions (Eastern, Central, and Western). The most recently established Chapter is located in Colorado of the Central Region.

Our membership is made up of both government and industry personnel, who are interested in property management as a profession. The fundamental purposes of NPMA as stated in our National By-Laws are:

(a) To enhance, to unite, to encourage, and to promote the property benefit of the members of the industries and the government of the United States of America.
(b) To further the knowledge of industrial property management.
(c) To encourage the understanding of viewpoints, problems and ideas among personnel of the government, industry and the general public.
(d) To provide a forum for the exchange of ideas between industry and government personnel conducive to the establishment of more effective working relationships.
(e) To develop effective solutions to the problems encountered by government and industry personnel.
(f) To further the capacity to devise, establish, and maintain sound programs and procedures for efficient industrial and government property management.

One of the member chapters sponsors a National Seminar each year. You will read more about the 1973 Seminar elsewhere in this issue. Each of the National Seminars has been a huge success. Each year they seem to get better and, of course, this is the way it should be.

One thing which has been made abundantly clear to the National Officers of NPMA, by the membership, is that we have lacked a good, professional publication. Heretofore, we have published a "bulletin" at least six times a year, and published the program of the National Seminar.

At the last National Board Meeting, we pledged to our membership that we would do something positive to put a professional publication in their hands. We were impressed with the PERFORMANCE Magazine and hope that this will be a welcome answer to the questions from our membership.

We trust that our goals and purposes will complement those of the other Professional Associations with whom we share this magazine and that all members of NPMA will take the time to carefully read each issue in its entirety.

Very truly yours,

DONALD M. FRY, President
NPMA-National

PERFORMANCE
NEW! AND NOW AVAILABLE!

Two important additions to every Progressive Value Engineering Library, for effective Value Program planning.

1. The VALUE ENGINEERING PROJECT HANDBOOK  
   by E. D. Heller  
   $3.95

   This bound 8½ x 11 workbook contains more than 31 full pages of ready-to-use charts, forms and work sheets, arranged in JOB PLAN order for use in conducting any in-depth VE Seminar or task study.

   The Author, Ed Heller, is a recognized outstanding educational authority and senior consultant practitioner in the field of Value Engineering.

   This workbook is a must for planning and structuring your VE Seminar effectively and will save you many hours and dollars.

2. Techniques of ADMINISTRATIVE VALUE ANALYSIS  
   by Fred F. Fifield  
   $2.50

   This 14 page, 8½ x 11 Manual contains the techniques, directions, and format for the practical and successful application of Value Analysis to Management, Organizational and Administrative functions. The manual’s clear and concise presentation makes it simple for any Value Specialist to understand and tackle Administrative cost improvement tasks.

   The Author, Fred Fifield has developed his techniques through on-the-job experience as a Management consultant. AVA applies the Value Analysis job plan and techniques in a unique way, especially tailored to Management and Administrative functions and activities. It is the latest in practical cost control and value assurance applications for those who want to optimize all cost factors.

SPECIAL INTRODUCTORY OFFER  
$5.50

Both books may be purchased together for $5.50 or, if any total of 6 or more books are ordered, deduct 20% discount from the listed price. Just complete and mail this handy order form.

To: Society of American Value Engineers, Inc.  
2550 Hargrove Drive – L205, Smyrna, Georgia 30080

Please send me, postpaid, ______ copies of item 1. ______ copies of item 2.

Name:______________________________________

Address:_____________________________________

City & State, Zip Code:________________________

Please enclose check or money order payable to the Society of American Value Engineers, Inc.
In the past few years, many businessmen and government leaders in the United States have shown increased support for a shift to the metric system of measurement. One proposal would establish an eleven-member board to formulate a coordinated national plan for a 75 percent change over a ten-year period. The Board would include representatives of industry, labor, trade associations, citizens groups and government. The Senate has already passed legislation to create such a Board, but the House took no action; the legislation will undoubtedly be reintroduced in the new Congress. It is anticipated that the plan would depend heavily on the voluntary cooperation of all industry groups in working out their own conversion timetable within the framework of the national goal.

The proposal to adopt the metric system has been debated for 150 years. Since 1893, the inch, yard and pound have been officially defined in terms of the meter and kilogram, and the use of metric units has gradually increased. Metric language is used predominantly in scientific, medical and engineering fields, and is used in math and science classes in many schools, even at the elementary level. The pharmaceutical and roller bearing industries have gone metric, many of our packaged goods are dually labeled, and the number of cars on our highways that require at least some metric parts and tools is increasing rapidly.

**IMPORTANCE FOR TRADE**

Probably the strongest stimulus for conversion, however, is growing concern about the position of the United States in world trade. In 1971, we had our first negative trade balance of the century. Although exports of American goods rose 110 percent over the past decade, Japanese exports quadrupled in the same period. Germany and other European nations have also expanded their world markets faster than has the United States. The United States is the only industrialized nation not already using the metric system or committed to a conversion program. Many countries were using metric units before World War II, and even Great Britain expects to complete its changeover by 1975. If the United States does not share this common technological language, our position in international trade could be further damaged. Because the trend in export trade is toward high-technology services and products that may be component parts to be incorporated with parts from other countries, uniform standards are essential.

Members of the Common Market and the European Free Trade Association have already coordinated their measurement and engineering standards. When a member country certifies that a product meets the standards agreed upon, all other countries adhering to the agreement will accept the item without further inspection or test. While this will facilitate trade among agreeing nations, it could obviously inhibit imports from countries outside the agreement. This would particularly affect "measurement-standard-sensitive" (MSS) products such as scientific instruments, transportation equipment and printing machinery. In 1969, the United States exported about $14 billion worth of MSS products, representing about 36 percent of our total exports for that year.

Those who support metrification emphasize the importance of the United States' getting involved in the international standards-making process now being carried on by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC). To date, only about 2500 international standards and recommendations have been adopted by IEC and ISO, but in the next decade, ten times that many standards are expected to be established. If the United States participates in this process, our practices and technology will be taken into consideration. Although some U.S. manufacturers will find adapting to the metric system costly, making compromises and changes concurrently with other nations will be less expensive than converting later to a "foreign" practice that does not reflect any of our current standards. Committing ourselves to metric standards for international trading purposes while retaining the inch-pound system for domestic use would increase the cost to manufacturers in the form of double inventories and production. Furthermore, gradual conversion on a product-by-product basis would cause more confusion than a planned, comprehensive conversion.
TO CHANGE THE FUTURE

BY AARON S. YOHALEM

Business today is in deep trouble. As deep — yes, even deeper, once we consider the circumstances — as the most perilous period of American business history, namely, the great bust of 1929 and the depression of the 30's.

We are all well aware that the established survey organizations report with regularity the continuing steep decline of business' esteem among the American public. The Opinion Research Corporation found last year that 60 percent of the American buying-public did not trust business, especially the larger corporations.

The Louis Harris organization reaffirmed these findings and noted that 87 percent of the consumers who were interviewed simply refused to believe advertising claims.

A survey by the American Management Association disclosed that 2 out of 3 of those corporations among the largest 500 felt that they have "serious corporate image problems" with the general public.

On even a deeper probe into the American public's attitudes toward business, the Daniel Yankelovich organization found, on the basis of several years of painstaking analysis, that one of the key social factors which must be taken into account in predicting the immediate future of the many public demands upon business is the present "low level of confidence" in the "imbalance" between private profit and public interest. This despite the fact that some 30 million of our people are shareholders in business — and many more participate in share ownership through their pension funds.

How, we must ask ourselves, have we come to such a state?

Technologically and normatively, society in the large is changing faster than business. Essentially, the material, root cause of these changes which confound us is to be found in the scientific, technological revolution of our times. Its effect is total.

The fall-out of our prodigious technological and industrial performance has been urban sprawl and a transportation crisis; sophisticated communication systems that tell the poor of their differences; medical miracles that aggravate the population crunch; flaunted affluence that sharpens the shame of poverty; elimination of the family farm and an American tradition; huge corporations, unions, bureaucracies and universities that generate "identity crises" among their constituencies and discontent within the commonweal.

Our technology and industrial performance have all too palpably lacked clear, resolved and balanced social perspectives. The human element has all too often been overlooked. Technology has lacked a critical sense of itself; an awareness of the societal context in which it operates and the social impact it necessarily generates. Technocracy has spawned the technocrat. In many major areas of our economy there has been a kind of mindlessness for which we are now paying high costs.

This would suggest, to me, the need for industry to study the new values of society with the same scale of investment in time, money, research and analysis that it brings to bear on a major new service or product line introduction. By this I mean that individual corporations, in the interest of improving on the best of the competitive system, should analyze the demographics of the new values as they affect their specific operations; define those areas where public demands are valid or not, make the adjustments necessary to meet legitimate complaints; and undertake the communication effort required to alert the public, and its elected leaders, to the adjustments made to areas of public misunderstanding or misinformation. And to communicate these facts downward, as well, beyond the executive suite to the people in our businesses who look for leadership and understanding of changing values.

I do trust the response will be a positive one; it had best be.

We are experts in managing our businesses. But the proponents of the quality of life of the new values are the experts at expressing their desires. We should not be annoyed by their new demands — but must stay ahead of them.

To restore credibility, however, will require more than simply restoring the vanishing art of listening. It will require that management review without prejudgment, and respond thoughtfully, to an array of societal proposals affecting private decisions having public consequence.

I would like to suggest that along with our own corporate committees on environment, minority employment, the cities and the like, we — in some way or in some manner — make certain that we maintain in industry the most realistic kind of self-criticism. That we, in effect, maintain some form of corporate counter-culture or "devil's advocate" mechanism with the task of continuously keeping us disabused, the better to keep us on our toes and performing credibly.

Business necessarily has to become more involved socially and more responsive to business in society. Business must be able to detach itself from its own myopic traditions. It must seek out, not automatically reject, reasonable critics. It must anticipate, indeed provide, progressive leadership in the years ahead which will probably be the most fateful in the history of American business, years of disharmony between business and the general public.

The question remains: Not, do we have the foresight to understand the future, but, do we have the courage to change it?
NEW CHALLENGES FOR QUALITY CONTROL MANAGERS

BY ALAN J. GRANT

It wasn’t many years ago that the quality control function was elevated from that of a “police force” to one of equal stature with its functional counterparts: engineering, manufacturing, and procurement. Today’s industrial environment is now demanding another change in the quality control manager’s perspective. The principal element of this change centers around the acceptance by management that an organization is more effective when all workers share in assuring the “quality” of the product.

Our new understanding of behavior patterns and the application of this understanding to industry requires that the role of the quality control manager be reviewed with respect to his sharing more in the internal business environment setting and also in management control. Furthermore, it appears that management should respond to these changes by creating closer ties between the senior quality control executive and the chief executive.
I’d like to share some observations of this change in the quality control perspective in companies abroad. I found, in a visit to Japan, that the greatest motivation to Japanese workers regarding quality was not through “inspection,” but rather was through the workers’ personal pride in their country. They rechecked their own work when an error was discovered, and were genuinely thankful when any shortcoming was identified before it left Japan! Motivation like this rarely results in the rework of an error must be handled differently. Regardless of whether the employee made the error or not, there is not an environment for him to accept any error graciously, so we must have separate rework lines.

Again, in a recent tour of Italy, I found their “production” lines to be, instead, a sort of “family gathering” of all the people who had to participate in the final assembly and buyoff of a particular electronic equipment. Here, the motivation was pride in their individual team. Again, a different kind of production attitude, but another example of workers being motivated through belonging to a group rather than as individuals drawing a paycheck.

In the United States there is a broad spectrum of worker attitudes, and some bright lights are shining here and there. I recall that in the May 1972 issue of Fortune Magazine’s “Executive Voice” an experiment was described wherein the workers chose their own assignments, there was no in-process inspection, work teams similar to those I had observed in Italy were organized, and there were no time clocks. There was an apparent increase in productivity. The quality control function was shared by everyone in the group. Since the objective was to have the best team, high quality resulted.

Most of us are aware that psychological studies over the last ten to fifteen years highlight a demand for a different attitude by management towards their employees and to the work environment. These findings were brought into focus through Douglas McGregor’s work in the late 1950s regarding two general management attitudes called “Theory X” and “Theory Y.” Theory X was based on a “sweatshop” environment where workers had to be watched and where the work was parcelled out and measured by “policemen.” Theory Y held that an individual wants to participate in group activities. By identifying his role in the work environment, higher productivity is certain to result. I believe that the majority of today’s industrial organizations use a combination of these two theories, unless there is a corporate-led policy to adhere to one or the other.

Another trend in behavioral science application consists of techniques such as goal-setting, where each individual participates in setting his own goals rather than management dictating them. Extension of this philosophy results in the current management vogue of “job enrichment” techniques.

Now, with these changes in our understanding of the behavioral patterns of people and in what they desire, and with the rising educational level of all our workers, it becomes evident that management’s attitude towards quality control, as well as towards other old-line functions, must be tempered so that the experiences of these functional disciplines are in tune with the behavioral science findings.

In addition, it’s interesting to note that the experience of quality control managers can be applied to other disciplines. The one in particular which I have in mind is a management technique called “functional audit.” Classically, in American industry, the financial operation is entrusted with the responsibility of auditing all operating entities to assure that they are following company policies. These are called “operational audits.” Normally, you will find that the individual performing this kind of audit is someone who has been around the company for many years. He is probably an accountant near retirement. I suggest that this function adapts itself far better to the disciplines of the quality control manager, and that this type of operational audit really should be part of the expanded scope of the quality control function.

The disciplines for measurement, the disciplines for control, and the disciplines for product audit already exist in the experiences and habit patterns of the quality control manager. Why, then, doesn’t industry assign the operational audit to the quality control function? I think this is an important subject to consider. In light of the change in management attitudes we must have to create a working team, as well as in light of what’s happening in other countries, it seems to me that the quality control function now, more than at any other time, must change and strengthen its corporate functional role.
In the DoD, VE is defined as a systematic effort directed at analyzing the functional requirements of DoD systems, equipment, facilities, procedures, and supplies for the purpose of achieving the essential functions at the lowest total cost, consistent with the needed performance, reliability, quality, and maintainability.

DCAS looks at VE and finds performance puzzling! Although VE effort rewards both Government and Industry for successful Value Engineering Change Proposals (VECPs), full commitment to the program is lacking — why?

Let's look at the benefits: Industry's reward is increased profits, a happy customer, and improved competitive position.

The Government's reward is reduced cost of ownership, increased reliability, updated technology, and improved maintainability. Both customer and producer benefit.

This article will attempt to analyze possible causes for the “less than optimum” program involvement. Obviously, any program which returns audited savings in the billions of dollars, has participation. There have been many papers written on the benefits available from the DoD VE Program. Seminars praising VE and its rewards are commonplace. DCAS, other Government agencies and The Society of American Value Engineers (SAVE) do all in their power to spread the word. Knowledge of the existence of the VE Program should be axiomatic. Surprisingly, however, in the writer's judgment, the greatest single cause for the lack of program involvement is either a lack of knowledge or an erroneous understanding of the VE Program on the part of many people both in Government and in Industry.

Mr. Clyde Parton, Vice President of Honeywell, Incorporated, speaking at a May 1972 VE Seminar sponsored by DCASR-Boston and Paul Revere Chapter SAVE, nicely described the program as, “This is a program which blends the contractor's opportunity to reduce and control cost with a real incentive to do so and thus improve his difficult profit and competitive situation.” Providing understanding to VE participants is of major importance. The Government and SAVE will continue their efforts in this area.

The Armed Services Procurement Regulation (ASPR) Sub-Committee is working on a rewrite to simplify the language of Part I, Section 17 of the ASPR for better understanding. The reader is invited to suggest other means which could be used effectively to further program intelligence. Reason would indicate the best means for acquiring comprehension is training. It is the writer's recommendation that all people who could be directly involved with the processing of a Value Engineering Change Proposal (VECP) receive mandatory training. Statistically, there is no doubt that financial return will repay cost many times over.

Ranking second, in the writer's judgment, as cause for lack of program involvement is the Government buyer or Industrial producer who tried it and didn’t like it. His VE Program failed. In the real world, there are daily failures of large and small companies. Divisions and Departments within a company fail. Every undertaking has potential. A simple analysis of readily available statistics will easily convince open-minded management that the reward is well worth the risks and accompanying problems.

Industry will not receive an acceptance rate of 100 percent on submitted VECPs. While the learning process is taking place, a discouraging “hit-rate” is often encountered. Confidence becomes shaky: Is a good VE Program good for the company? It becomes difficult to get needed resources committed to finding and marketing VECPs. The Government, on the other hand, sometimes buys unforeseen technical problems along with a VECP, and anticipated benefits can fail to materialize in total. The Government's administrative burden will increase.

The rewards from a successful VE Program are worth all associated problems! Good results relate directly to the pure desire to get those rewards.
Problems can be minimized. VECP acceptance rate will increase with learning. Confidence and management support of the program will improve with success. Industry is obligated to provide sufficient data with its VECP to allow the Government to make an intelligent decision relative to acceptance. Competent Government technical people, provided with that data, can make reasonable decisions with minimum risk.

The Government wants and needs Industry-originated VECPs. Every effort should be directed at increasing Industry participation in the program. It should be recognized that the Government is not doing Industry a favor by approving its VECP, but rather that Industry is helping the Government by offering its expertise. Remember that although a contractor receives substantial profits from his approved VECP, they are limited in time by contractual language. The Government, on the other hand, continues to benefit from the VECP for as long as the need for the item exists.

The contractor who is competent can (and does) earn astronomical benefits from the program. One contractor, for example, has an acceptance rate in the past five years of 70%, and his share of the dollars saved was $16,828,000. Degree of VE involvement must relate directly to history. The participant who receives some benefits wants more, and he who has trouble is reluctant to try again. The program is, to some extent, self-purging, by forcing the incompetent participant out of the arena. What of the competent participant who has trouble and is reluctant to try again? Competency dictates learning from mistakes. If the reward potential is there, and it is, the competent participant analyzes his problem, corrects it, competes again and wins.

DCAS looks at VE and finds performance puzzling! Yes, there are problems, but no more, and often less, than others found in Industry. Reward from a successful VE Program can be gigantic; in some cases, even exceeding profit return from normal business. How can enlightened management accept less than their share of potential VE awards? It has been estimated that only 10 percent of the good VECPs available have been identified and submitted – why?

A successful VE Program requires:

1. Complete Understanding of the VE Program.

2. Competent People.

3. The absolute desire to make the program work and thereby receive available benefits.

LOU WEISBERG joined Defense Contract Administration Services (DCAS) Region, Boston in July 1967 as a Staff Engineer in the Production Directorate. He is responsible for providing engineering advisory, consulting and analytical services to the Director and operating areas of the Directorate, and has been responsible for overall DCASR-Boston Value Engineering (VE) Program since 1967. The basic function of the DCAS VE Program is to motivate the active participation of Industry. Motivation is accomplished with Government/Industry face-to-face VE discussions. Potential benefits to both producer and customer from the VE Program are highlighted. Seminars, co-sponsored with the Society of American Value Engineers, have been very effective toward this end, with five conducted in the last five years. The DCAS VE mission is accomplished with effective support provided by each of 15 geographically separated offices in New England and New York State. DCASR-Boston's involvement in the program has been very encouraging with VE Change Proposals valued at $34.5 million processed in fiscal year 71 and $44.1 million in fiscal year 72.
Too many people these days are fine examples of people getting so caught up in their own areas of activity that they forget the direction in which they are going. You know the type...the paper shuffler, the person who is primarily interested in moving papers from the in-basket to the out-basket by the end of the day in a flurry of activity, only to find the (seemingly) same papers in his in-basket the following morning! Too many of us get involved with the process of doing our job, rather than concentrating on the results which we are achieving. Let’s not confuse activity with accomplishment!

The system for results accomplishment which I am going to outline is, naturally, tailored to the Suggestion System Administrator; however, it has been found to be a valuable tool in all levels of management and in all types of organizations (including our own company). It is a management by objectives system which concentrates on results.

Back in the days of my university teaching experience, students used to ask the question, “Can’t I get something for trying...isn’t there an ‘A’ for effort?” Of course, the answer is obvious; there is no room in the dynamic world of business for reward for effort...it is purposeful effort and results that count! The great, late Vince Lombardi used to say, “Winning isn’t everything, it’s the only thing.” Good intentions not only pave the way to hell in one’s personal life but clearly they’re just not good enough. There is no substitute for victory, for results accomplishment is the common denominator of all successful people. The system which I am about to describe will make you a winner every step of the way.

The system is not just a tool or a technique to achieve results but an entire system of managing...a management philosophy, if you will. At the end of the day, no matter how busy you or the whole organization has been, it is the results that are the important thing. Without results we don’t stay in business! Because this system helps build a climate of motivation it is compatible with suggestion system concepts. It fosters suggestion system development because it’s an effective management process, focusing on the strong motivation value of the need for achievement. This system...
allows for the satisfaction of this need category. Finally, its overall purpose is not to make managers work more, but more effectively — work smarter, not harder!

Would you be interested in a system that: 1) changes performance in a positive direction, 2) improves participating involvement, 3) increases communication so that everyone knows where he or she stands in performance effectiveness, 4) produces greater results, 5) assists in the growth of challenge and reward?

There are three major processes involved with the practical application of this management system: a) developing objectives, b) converting these objectives into an operating plan, and c) measuring progress towards the achievement of objectives.

### Developing objectives — First, overall objectives must be established in connection with your input on the total organization budget, and particularly for your own department. These budgets must reflect requirements needed to implement the proposed objectives. Of course, your final objectives must take into consideration the resources made available in your adopted budget.

Secondly, you must define the major functions of the suggestion system. This is a valuable exercise as it requires each manager to analyze the role of his unit in relation to the overall mission of the enterprise. This definition should cover the major responsibilities (which normally are not under 5); furthermore, objectives must be broken down into two categories, regular and special. The regular objectives are derived from the major functions as outlined and should represent an improvement in the performance of the system in comparison with the prior year — concentrate on planning for improvement. The special objectives are defined after the regular objectives; they generally involve one-time projects of particular importance to your organization and/or department. They should be limited in number — with a total weighing of not more than 20 percent of the total for the unit.

### Converting objectives into an operating plan — For the desired results to be achieved, objectives must be transferred into a plan of action. In

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<th>OBJECTIVE</th>
<th>POINT VALUE</th>
<th>% ACHIEVEMENT</th>
<th>RATING</th>
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<tr>
<td>1. Increase participation ratio by 10%</td>
<td>10</td>
<td>90</td>
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<td>2. Reduce average processing time to 34 days</td>
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<td>3. Increase adoptions by 20%</td>
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<td>4. Increase supervisor/employee suggestion contact by 12%</td>
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<td>5. Increase general attitudes by 15%</td>
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<td>100</td>
<td>5</td>
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<td>6. Increase awards by 12%</td>
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<td>7. Increase net savings by 12%</td>
<td>20</td>
<td>95</td>
<td>19</td>
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<tr>
<td>8. Redesign and implement new suggestion booklet</td>
<td>5</td>
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<td><strong>Total</strong></td>
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determining the operating plan, major emphasis should be placed on increasing productivity and/or reducing costs. Naturally, the techniques used will depend on the nature of the event to be accomplished. The next step in this system is to establish a work schedule, identifying the events to be completed in carrying out the objective. Time estimates, deadlines, and a system for monitoring progress in the completion of events according to the deadlines must then be established.

c. Measuring progress — In this system of concentration on results, continuous evaluation of progress towards the achievement of objectives is essential. Monthly reports should record actual performance in relation to established goals; progress reports — prepared at least every three months — should indicate what percentage of agreed-upon improvements have been attained at that time. In discussing with subordinates or superiors, you should review progress, discuss obstacles to the attaining of objectives, discuss alternative methods to overcoming problems, and revise objectives where necessary.

The performance report is accomplished on an annual basis and forms the foundation for a performance review. To complete this report, first determine the percent of achievement for each particular objective, then multiply the point value of each objective times its percent of achievement to get the total rating for that objective. Last, total all of the ratings: This becomes the overall performance rating for the time period.

WHAT'S THE PAYOFF?

Essentially the benefits of this system are long-term. There will be a
definite shift to concentration on results and people's attitudes will change to think in "results" terms. You will also have a more realistic analysis of training dollar investment and its return in terms of developing a goal-directed, behavioral change. Please don't say "Training's not my job, that's the job of the training department." The training job is the job of every manager. You must be constantly running training programs to teach the employees how to use the Suggestion System, to understand its value, and to recognize the opportunity to make a creative solution to a problem. With regard to the training function, and to the areas in which the performance of your System did not meet expectations (agreed-upon performance objectives), you must first determine these areas, analyze them, and find out the reason(s) why the results did not meet the expectations. This "results system" allows you to do just that.

Because this system requires a clear-cut policy definition, the total organization will have a greater clarity of purpose including greater planning, organization, and control of each department. It also focuses on the concentration of planned improvement — we don't want it to just "happen," we want to be in control of what's happening. Your organization will also benefit from a developing belief in the value of the "accountability for results" principle and in delegation of authority within defined policy limits. Last, you'll notice a greater contribution of ideas (quantity) and a greater contribution from ideas (quality)!

The essential ingredient is, of course, total commitment. To give a subordinate more freedom to manage may not be so easy, so total commitment is the lubricant that makes the wheels of this system move. If you have faith in the system and you believe it will work, it can work towards even greater success accomplishments of your Suggestion Program.

In summary, let me quote a couple of items which directly relate to your employees' faith (and yours) in your Suggestion System Program: "Whatever the mind of man can conceive and believe, it can achieve," Dr. Napoleon Hill; "Ask and it shall be given unto you, seek and ye shall find, knock and it shall be open unto you," Matthew 7:7.

By utilizing this system, I think you'll realize the benefits as outlined. You will break out of the slave of conformity and of overzeal for process and concentrate on results. Yes, you won't confuse activity with accomplishment.

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**Quarterly Progress Report - Period Ending: December 14, 1972**

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<td>80%</td>
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<td>4. Increase supervisor/employee contact by 12%</td>
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<td>5. Increase general attitudes by 15%</td>
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<tr>
<td>6. Increase awards by 12%</td>
<td>92%</td>
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<tr>
<td>7. Increase Net Savings by 12%</td>
<td>90%</td>
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<tr>
<td>8. Redesign and implement new employee suggestion booklet</td>
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The purpose of this paper is to identify industrial property management as a separate and distinct management function, note some typical problem areas, and propound solutions or recommendations for solution of the problems.

Industrial property at cost, as exhibited in annual financial statements to the stockholders, is generally a corporation's largest single asset. The size of this investment justifies a degree of control usually non-existent in today's diversified corporations. The paramount reason for lack of control to date has been the inability of companies to efficiently handle the masses of data relating to property. The advent and development of the computer negates the previously accepted "reason" for lack of control.

The deep involvement of the federal government as a purchaser of goods and services adds impetus to corporations to devise and maintain industrial property management systems.

Despite stated policies to the contrary, the federal government has, and is, in the business of furnishing industrial property to companies who successfully compete for government business.

The Department of Defense alone is currently providing some $13.4 billion dollars worth of government-owned industrial property to its contractors. Traditionally, the federal government has accomplished apparent largess with rules and regulations. Industrial property has not escaped this tradition. Stringent requirements are levied against the holders of government-owned industrial property to maintain systems and operations to acquire, control, use, maintain, and dispose of such property. These rules and regulations, with intolerable penalties for failure to comply, are promulgated by various federal agencies. The Department of Defense, Department of Transportation, National Aeronautics and Space Administration, Federal Aviation Agency, and the General Services Administration are major participants in devising these rules and regulations.

Congressional (political) influence in establishing policies and regulations is exerted through the dependency of the federal agencies on the Congress for funds.

The impact of these influences is demonstrated by the following excerpts from Armed Services Procurement Regulations (ASPR), "Property Administration. The contractor shall comply with provisions of Appendix B, Armed Services Procurement Regulation, as in effect on the date of the contract..." (Government Property Clause ASPR 7-104.24).

"The contractor shall be directly responsible for and accountable for all government property in accordance with the provisions of the contract,
including property provided under such contract which may be in the possession or control of a subcontractor. The contractor shall establish and maintain a system (in accordance with the provisions of this Appendix) to control, protect, preserve, and maintain all government property. The contractor's property control system shall be in writing..." (ASPR Appendix B-101).

"...the contractor may be liable when shortages of government property are disclosed or when government property is lost, damaged or destroyed, or when there is evidence of unreasonable use or consumption of government property...” (ASPR Appendix B-203).

"It is the government policy to rely upon contractor property control records...The contractor shall establish and maintain adequate control records, either manual or mechanized in accordance with requirements of this Appendix...” (ASPR Appendix B-301).

"The contractor shall periodically physically inventory all government property...” (ASPR Appendix B-501).

"The contractor's government property control system shall be audited by the government as frequently as conditions warrant.” (ASPR Appendix B-104).

"Correction of Defective System for Control of Government Property. When the property administrator is not successful in obtaining compliance with contract requirements, he shall advise the contracting officer...who will advise the contractor that approval of his property control system will be withheld unless corrective action is accomplished within the specified period. Such notice shall also advise the contractor that in event approval of his system is withheld (1) his liability for loss or damage may be increased, and (2) information concerning the property control system shall be entered in the Contractor Performance Record...” (ASPR 13-108).

So, with these driving forces in mind -- the large investment involved and the substantial influence of government participation, it is proper to examine the anatomy of industrial property management.

In order to provide understanding of the complexity of the subject, certain definitions must be understood.

Several of the most common used by industry and the government include:

**Industrial property** means both real and personal property under the control of a management, which is used to convert labor into a going enterprise. **Industrial property** has many sub-titles or identifications. These identifications usually relate to ownership, purpose, use, tax provisions, source, cost, specification information, depreciation and other similar factors. Some of these definitions, most frequently used, are:

**Materials** means property which may be incorporated into, or attached to, an end item to be delivered, or which may be consumed in the production of an end item. Raw and processed material, parts, components, assemblies, and supplies comprise the bulk of materials as a property type. **Special Tooling** (ST) relates to jigs, dies, fixtures, molds, patterns, tapers, gauges, etc., of a special nature, dedicated to a particular part or end item.

**Special Test Equipment** (STE) means electrical, electronic, hydraulic, pneumatic, mechanical or other devices especially configured to test particular parts or end items.

**Facilities** means real property, rights therein, buildings, structures, improvements, and plant equipment. **Military property** means various hardware systems or components furnished to government contractors under terms of contracts for supplies or services.

**Capital property**, which may include special tooling, test equipment, or facilities, is property capitalized in accordance with accounting policies at some dollar level and depreciated for tax purposes in accordance with Internal Revenue Service rules. (A common capitalization level is at a unit cost of $200 with a life expectancy over two years.)

**Leased property** is a minor item of any type, temporarily acquired by lease, under company control.

**Expense property** is a minor item of any type, not capitalized and traditionally "written off" or completely depreciated at the time of acquisition or in a current operating year. Each of the above definitions in turn have sub-titles or components.

For instance, under **Facilities**, more specific terms are applied, such as: **Real property**, utility distribution systems, plant equipment, industrial plant equipment, minor plant equipment, other plant equipment, etc.

The further expansion of terminology, as noted above, obviously further complicates any effort to understand the scope of the subject and is part of the "reason" for lack of control of industrial property to date.

Another element, which compounds the complexity of industrial property management, is that property has a recognized life cycle which provides a basis for status and control. This life cycle serves as the key to property audit by interested parties (company and government).

The conventional life cycle, commonly used by government and industry, consists of:

1. **Requirements** -- that point in time and area of effort in which a need for property is established.

2. **Acquisition** -- the activity involved in purchasing, manufacturing, leasing or otherwise gaining possession of the property -- from whatever source.

3. **Receiving** -- the action involved in purchasing, manufacturing, leasing or otherwise whatever source.

4. **Identification** -- the business of categorizing, cataloging, establishing type, and physically marking, tagging, etc., in preparation of placing the item under control.

5. **Records** (or **Recording**) -- the establishment of the accounting and subsidiary records to be maintained during the period of time the property is retained by the company. (As we will see in the final analysis, this activity or phase is the guts, blood, and feathers of property management.)

6. **Storage, and Movement** -- the process of moving and storing all types of property when not in use.

7. **Consumption** -- the process of incorporating property in an end item, or otherwise consuming it in performance of manufacture of supplies or providing services.

8. **Utilization** -- the act or process of using property for its intended purpose.

9. **Maintenance** -- provision for the care and repair of property necessary
to obtain its most useful life.

10. **Inventory** — the process of physically locating and accounting for property to assure its continued custody and verify its existence.

11. **Disposition** — effecting disposal of property, by whatever means, when its retention is no longer desired or warranted.

From definitions of property types and the life cycle just discussed, we can now establish the skeleton of industrial property management by use of a matrix: (See Figure I)

**At first blush,** examination of the matrix would lead one to believe that we have discovered a relatively simple situation. Such is not the case. As we probe further we find added dimensions to each block of the matrix. These extra dimensions are created by three additional factors not yet considered.

1. Details of activities involved in each block.
2. The company organizational overlay.
3. Information requirements.

As an example, let us examine the block of Facilities — Records. What goes on here? First, we find a need for records of **requirements.** In a typical company of several thousand employees we can find documents pertaining to such things as:

1. A statement of need for capital items — land, buildings, improvements, and various types of plant equipment — contained in a forward year planning document or capital budget.
2. A justification of the need to

**Figure I**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Acquisition</th>
<th>Receiving</th>
<th>Identification</th>
<th>Records</th>
<th>Storage &amp; Movement</th>
<th>Consumption</th>
<th>Utilization</th>
<th>Maintenance</th>
<th>Inventory</th>
<th>Disposition</th>
</tr>
</thead>
</table>

**Moving on to acquisition records,** we find:

1. The basic funding document which passes on to the acquisition phase.
2. The purchase request.
3. Documentation of bids or negotiation and awards.
4. The purchase order, acquiring contract, or in-house planning and authorization paper.
5. Follow-up or expediting correspondence.

**Receiving** records include, but are not limited to:

1. A receiving report.
2. Documents relating to receiving inspection.
3. Associated bills of lading.
4. Testing and calibration of certain items.
5. Overages, shortages, damaged shipments, items not ordered, and other discrepancies.
6. Some type move or forwarding document, sending the item on toward its ultimate (temporary) destination.

**Identification** becomes necessary. Some examples are:

1. Record of classification.
2. Extraction and recording of performance data such as size, color, horsepower, range, weight, and other physical characteristics, manufacturer, part number, model number, etc.
3. Records of tagging or marking — please note that at this point we have reached a hard point interface with all other types of property since duplicate tag numbers must be avoided and some type of compatible system developed for all property.

**Moving on to storage and movement records,** one finds:

1. Requests for movement.
2. Move documents (remember the receiving activity).
4. The need for location changes in the master record.

In the **consumption** area, records can include information such as:

1. Quantity required.
2. Quantity received.
3. Quantity used.
4. Quantity rejected.
5. Quantity scrapped.
6. Quantity on hand.

**Utilization** records can be de-
Maintenance records necessarily contain large quantities of data. Of primary concern is information about the physical characteristics of facilities to enable prompt and proper lubrication, condition assessment, care, and repair. Aside from these factors, it is also necessary to keep records of location and historical data both from a cost and parts viewpoint. The requirement (as for government equipment) or need (for company equipment) for a preventive maintenance program opens another ball game. Records needed include:

1. How many do we have.
2. Where are they.
3. What actions are to be performed (oiling, inspecting, etc.).
4. What frequency or how often is maintenance necessary.
5. Work to be done (schedule).
7. Work past due.
8. Cost of the program.

Inventory records include:

1. How many are we supposed to have.
2. Where are they.
3. What is their identity.
4. How many did we count.
5. How many were we over or short.
6. Reconciliation of overages, shortages, and records to show the new status.

Disposition records for facilities probably contain information about:

1. Declaration of excess or surplus.
2. Screening for reallocation or reuse.
3. Decisions to dispose.
4. Sales documents such as advertisements to sell, bids, awards, money collected, shipping documents, title passing documents.
5. Adjustment of the master record.

While we have suggested some information that the Records - Facilities block provides, let's look at the impact the company organization has on the connected activities, records, and required information.

For purposes of this discussion, let us limit ourselves to the simple life cycle of a single machine tool. (Departments mentioned are assumed to have stated responsibilities.)

Manufacturing expresses a need for an item of equipment. Industrial Engineering evaluates the need and finds it valid. Facilities places the item in the capital budget. Management approves the budget. Manufacturing Engineering conducts studies of precise requirements and prepares specifications. Management reviews, agrees, and approves the expenditure. Accounting places funds in a commitment position. Purchasing solicits bids for the item.

Purchasing, Manufacturing and Manufacturing Engineering review the bids and agree on the item as to cost, quality, and compliance with specifications. Purchasing places the purchase order. Accounting records the obligation. Materials receives the item on the company dock. Receiving Inspection inspects the item and finds it in good order. Accounting is notified and places the item "on the books." Facilities and Materials tag the item with a numbered tag and establish an accountable record including nomenclature, manufacturer, physical details, cost, and other details.

Materials forwards the item to Quality Assurance for calibration and check-out. Plant Engineering designs utility connections and foundation; Plant Layout locates the equipment. Maintenance installs the equipment. Accounting accumulates and records installation costs. Maintenance sets up a preventive maintenance program for the item and maintains it while Manufacturing uses it for its originally intended purpose. Industrial Engineering includes the item in their load groups and maintains utilization records. Planning adds the characteristics and availability of the item to their resource information.

Eventually, Manufacturing no longer needs the item. Facilities screens requirements and finds Engineering R&D has need or use of it. Plant Engineering and Plant Layout develop the new location. Maintenance moves and re-installs the item. Use continues until need expires. We assume that Facilities re-screening finds no further use for the item (a rare instance, incidentally). Facilities makes a surplus declaration. Management approves. Maintenance de-installs the equipment. Salvage advertises it for sale. Disposal prepares sales documents and closes the sale. Accounting receives payment and removes the items from its "books." All other organizations, who have records of the item, also clear their records. Maintenance clears its inventory of spare parts, creating another disposal cycle. Finally, the cycle has ended.

When we apply this over-simplified chain of events and organizational involvement to our initial matrix, we find so many added dimensions that it becomes unintelligible and finally we begin to understand the "reason" for lack of control asserted initially.

Then, when we realize that a several-thousand employee company will have been 2,000 and 30,000 facility property items, in a continually dynamic environment, the volume of transactions becomes staggering. When another 50,000-300,000 items of special tooling are added to the facilities items, it begins to boggle the mind. The further addition of items, from other classes or types of property, simply compounds the problem.

Summarizing to this point, we find evidence that:

1. The language of property management is complicated by requirements for many types of information.
2. The life cycle of property, in its simplest form, probably gives a key to management techniques.
3. Extensive organizational involvement and need for information about property compounds the complexity of the basic question: "How to manage industrial property?"
4. The volume of items to be controlled or contained in the envelope of property management creates a requirement for manipulation of a fantastic amount of data. In order for management to be effective, these data must be readily available.
5. The foregoing seems to dictate a systems approach. This is especially true for government contractors because of the aforementioned "systems" legal obligation.
After analyzing these points, we can conclude that a possible starting point for system development is in the organizational structure created to manage property.

A first alternative has been inherited from government contractors who faced early government requirements in the late 1940s and early 1950s. Most of these companies were organized along line-staff principles. Each line organization performed some reasonably specific function. For instance, Accounting, Manufacturing, Engineering, Quality Control, and others were basically responsible for all activities to perform functions implied by their titles. Management reaction to new contractual property requirements was simply to charge each of these departments with property responsibility.

By-and-large each did the job reasonably well. They were able to acquire, control, use and dispose of property they needed to do their specific job. Of course, there were some problems in areas where two or more departments needed or used the same things (property) to meet their responsibilities. The state of business was such that in these events, duplicate items were acquired.

Two basic problems plagued operations under this concept. First, there was no visibility of total assets — from a top management level. Second, each of the departments developed their own procedures, forms and methods for operation. A lack of standardization resulted.

A third problem arose as a general business decline occurred. The “property people” were among the first to be laid off because departmental management did not recognize their role as a direct contributor to the primary function of the department — they did not put parts together, they did not inspect, etc. Again, the results are predictable. The property responsibility, which remained unchanged, was handled on a part-time, haphazard or “unassigned” basis. Control, records, visibility, and activity declined. This in turn led to trouble with property inspection and audit agencies, which in turn resulted in most companies abandoning the decentralized concept.

In today’s climate, with the aid of the computer, decentralized systems can survive but are generally marginal. The next alternative, adopted to get out of the trouble caused by decentralized property management or systems, was the stand alone concept which dates to the late 1950s and early 1960s.

For the first time property types (mentioned earlier) were defined and various organizations in the companies were assigned responsibility for all of a type of property. The Manufacturing Department usually became the province for special tooling. Engineering “took care of” special test equipment. The Facilities Department was responsible for facility items. The Materials Department was assigned materials and military property.

Although the problem of “non-productive property people” was mitigated to some degree by this concept and connected assignments, it too had (has) the same shortcomings as the decentralized concept — lack of standardization of records and effort, and lack of total visibility by top management. The stand alones also generated some other problems. Since each of the departments having a stand alone system had to become a service agency to several other departments — or ostensibly to the entire company — a high level of redundancy developed. The using departments found it necessary to appeal to several others to fill requirements.

Departmental feuds erupted from time to time when requests were rejected and personalities entered the picture. In the final analysis stand alones did not prove to be effective. In many companies their final demise was brought about by government disapproval of such systems in the mid-to-late 1960s. These disapprovals were prompted by several General Accounting Office (GAO) studies of government property in contractor plants. The ensuing reports cited outlandish abuse and misuse of that property.

Again, in today’s climate, with the aid of the computer, stand alones can survive despite problems noted above.

A third alternative was tried by some companies when the projectized or program management theories came into vogue in the mid-to-late 1960s (about the time that government disapprovals were beginning to occur). The Program Management Office (PMO) concept for property management paralleled the same system for product management.

Briefly, administration offices were formed to control or report status of line organization functions. Their objectives were improvement of cost, quality, and schedule relating to a specific manufacturing or production program.

The property PMO version basically called for an organization, usually called Property Administration or Property Management, to become a coordinator of the efforts of decentralized or stand alone operations. Guidance, counsel, problem solving and direction (without line authority) was the forte of the PMO. Some limited success in property management was achieved by these organizations. Generally speaking they were effective in producing and implementing company-wide standards with respect to record keeping. In some instances, they served as “tattle tales” or “cops” rather than exerting a constructive influence. The political climates in which they operated frequently spelled disaster for their efforts. They had the disadvantage of working against vested interests.

For instance, when applied as a crutch to a decentralized or stand alone system they found themselves charged with responsibility for assuming intelligent utilization of property. They could see the redundancy of equipment in various departments. Yet when they suggested or acted to pool common use equipment to reduce duplication and capital investment, the departments who were comfortably holding their “own” equipment refused to cooperate. Departmental enemies were also created as the simple result of the normal human reluctance to change. So, in the high counsels of management, the property PMO was frequently voted out of office.

The few PMOs who were successful almost invariably managed to achieve this feat by developing a centralized look. They were able to acquire or develop consolidated records and to provide management and the departments with needed information. PMO’s survival and effectiveness in the business world of today is contingent upon their ability to duplicate the successful PMOs of the late 1960s. They must develop means to become the
central source of property information. From that position of strength, the guidance and counsel of professional property managers can be exerted in behalf of the company and management objectives. The computer, again, offers the opportunity to make this happen.

The more far-sighted (or lucky) companies, who are leaders in the property management field today, escaped the intermediate steps of stand alones and PMO and moved directly from decentralized to a strong centralized property management organization. In some instances the transition was arduous because it was made using manual systems. Even under these circumstances, however, advantage accrued because when the further transition to the computer was made, an adequate data base existed.

The centralized concept of property management embraces certain tenets which should obviate most of the problems mentioned in connection with other concepts. These tenets include (but are not limited to):

1. Establishment of a single organization whose primary and sole purpose or objective is the intelligent and effective management of property.
2. Location of that organization at a relatively high level in the company structure - subservient to none of the property using organizations.
3. Delegation of authority and responsibility to accomplish stated objectives.
4. Establishment of a formalized system to provide for flow, recording, audit, and promulgation of property information and instructions.
5. Use of the computer, when justified due to volume or cost effectiveness.

These systems, developed and implemented in the late 1960s and 1970s, are alive and well. Several people who participated in their evolution have now formed the first cult of property management consultants.


This book is the best and most comprehensive book ever written on the subject of Value Engineering and should be required reading for every Value Analyst, Engineer and Manager. It clearly illustrates how management and professional personnel can use Value Analysis and Engineering to identify and remove unnecessary cost, i.e., cost that provides neither quality nor use, nor life, nor appearance, nor customer features.

It is evident that the author has had practical experience in VA/E and, as a result of this experience, he was able to portray the situation as it really is and provide a lucid and highly readable treatment of the subject. This book can be used as a guide to disciplined thinking for management and professional personnel. The author demonstrates how a logical, step-by-step approach can be used to improve problem solving, creativity, and decision making, which are the keys to increased value in products and services. This is the first book that clearly states the relationship of value to function in such a manner that management personnel can understand "Functional Analysis" and readily see the benefits from this fundamental concept. This concept provides the groundwork that is later developed, and is fundamental for an understanding of those portions of the book devoted to problem-setting and solving, organizing and using the system effectively, and understanding the decision-making environment.

The thoroughness of the author is demonstrated by the number of rather specialized uses of VA/E which are covered. A chapter is devoted to the setting and solving of services problems, specifically with reference to city government, while another discusses the construction industry and its related VA/E applications. The effects of VA/E on other work in a given business is the subject of another chapter covering accounting, cost reduction programs and purchasing functions, among others.

One part discusses the subject of research and development, with emphasis on Military contracts and organizing research and development problems for value analysis/engineering application. For the more experienced value analyst, some advanced techniques are included, notably the Function Analysis System Technique (FAST) developed by Charles W. Bytheway, Value Engineering Seminar Director of UNIVAC, Salt Lake City, Defense Systems Division, Sperry Rand Corporation.

In summary, this is a very valuable book for managers, engineers, analysts, architects, builders, contractors, homeowners and seminar instructors, and is highly recommended as a valuable reference and text. - Jack C. Strickland
INFORMAL TRAINING

By Frank Parker
Zero Defects Coordinator
AiResearch Manufacturing Company

FRANK PARKER received his higher education at St. John's University, New York, and entered the aerospace industry twenty-two years ago as a welder. Since then, he has held positions as Inspector, X-Ray Technician, Metallurgical Technician, and Inspection Foreman. He has been a Quality Assurance Engineer for AiResearch since 1963, and presently is serving as Zero Defects Coordinator.

Our social historians have, in recent months, called attention to indications of shifts in the work attitudes of much of our industrial work force. Lead articles in major magazines have suggested that a sizable number of those emerging from the Pepsi generation and entering the ranks of industry do not, in fact, revere the Puritan work ethic philosophy with the same intensity as those who have preceded.

Although it seems unwise to condemn an entire generation, perhaps there is some truth to the premise that some—perhaps many—who grew up in a more sophisticated age are indeed more susceptible to "boredom on the assembly line." Maintaining product quality can be a major problem with employees who are truly bored while performing their job assignments.

The effect of bored employees is first noticed in assembly line operations such as the automotive industry. Increased automation normally calls for a reduction in skills. This, coupled with a tight clock and many repetitive tasks, leaves the door open to a higher degree of product non-conformity—a very real problem to those charged with productivity gains and quality assurance.

The AiResearch Manufacturing Division of The Garrett Corporation, Los Angeles, California, has, from its beginning, been concerned with the successful performance of manned flights at higher altitudes and higher speeds. This has been accomplished
through pioneering efforts in the design and manufacture of components and subsystems in cabin pressurization, air-conditioning and flight data. AiResearch has supplied the vital life-supporting environmental control systems for the Mercury, Gemini and Apollo Space Programs. The current major product systems activities include: space environmental and cryogenic, aircraft environmental, missile, heat transfer, and life science.

Programs of this nature demand much more than run-of-the-mill care and precaution in assembly and processing operations. Lack of care and substandard craftsmanship can have devastating consequences. In an effort to maintain the history of fine workmanship that we feel has always been a feature of our operations, we recently instituted a series of after-hours training sessions. The theme: objectives of our hardware role in SKYLAB. We felt that participation by management, at this stage, was an absolute must...the positive response that we received from those who attended indicated that we were correct. (Contrary to what some may feel, it has been our experience that the man on the bench will go out of his way to listen to management...particularly in sessions of this nature where tangible information is being offered.)

Attendance at the second session increased slightly — this was to be our experience throughout the remainder of the series. The subject “Contamination and Control, Clean Rooms,” consisted of a slide and talk presentation by one of our Quality Assurance Engineers who has been totally involved in this type of activity for many years. This presentation was highly successful...in addition to the normal points of discussion — non-volatile residues, types of cleaning media, types of clean room constructions, etc. — the speaker made excellent use of 35mm slides to supplement his discussion.

The third session brought an additional slight increase in attendance. On this occasion, our Packaging Engineer put on an excellent show, combining actual demonstrations of various drop tests with handouts of several new materials being developed and utilized. And once more, we obtained a short 15-minute motion picture showing, in dramatic fashion, several consequences of incorrect material handling.

Attendance continued to increase throughout the final two sessions. The fourth session consisted of an informal address by a member of our Space and Cryogenics Engineering group, supplemented with slides and actual physical examples of assembly errors. The fifth and final session in the series, exploring various functional testing problems, was delivered by a member of Test Engineering.

Thus, our series was, we thought, concluded. Within the next few weeks, however, we were met with numerous inquiries, to wit: “When are we going to have more get-togethers?” It appeared, oddly enough, that one of the reasons for the favorable response was the social aspect of the classes — coffee and doughnuts, no written or oral examination, etc. — just simply an informal gathering, coupled with a dissemination of knowledge by experts in their fields. In each instance, the speakers were people who appreciated the opportunity of being provided with a forum to get their point across; while those attending seemed to like the idea of getting a chance to listen to people who, in the past, they may only have seen from a distance.

Thus the decision was made to continue the sessions on the same informal basis for an indefinite sustaining period. Because various of the special processes seem to be the least understood and among the most important of our activities, the following twelve-point program was outlined with particular emphasis on processing:
This second series of twelve sessions were scheduled for forty-five minutes each...it was felt that a full hour was perhaps stretching it just a bit for men who have just completed an eight-hour shift. In order to make the date easy to remember, we settled on the first Wednesday of each month. The gradual increase in attendance at each class has revealed that this regularly scheduled time is probably helpful.

Having now progressed through Session No. 6 (the first of our two plating classes), it is appropriate to review our program and ask ourselves, “What have been the benefits? Has this exercise been worthwhile? What has it bought us in terms of increased product quality?”

At this point, we really don’t know. Near the conclusion of these sessions, it is hoped that an analysis of our accumulative Quality Reports will reveal a decrease in non-conforming items – particularly in terms of those characteristics that have been covered in the lectures.

However, there have been signs which tend to indicate that the classes do assist in providing another facet to a favorable working environment. A typical example involved an inspector who attended both of the welding classes of our sessions. The inspector in question is normally involved in dimensional inspection only. In recent months, however, production line changes resulted in a small but constant volume of parts that required a weld inspection disposition to cross his work station. Because of his unfamiliarity with weld criteria, he re-routed these parts every day to the weld inspection area – with the attendant loss in time, extra handling, etc. Following his attendance at the welding classes (and the removal of some of the mysteries that welding had for him), he initiated a short program of independent study on the subject. Within six weeks, he became eligible for certification as a weld inspector. This, of course, not only adds another dimension to his previous skills but helps, in this one area at least, in the smoother flow of production items.

Another instance involved an expeditor who, in transporting material from a cleaning line to a fabricating area, noticed that an alkaline bath-heating element was not connected and the bath was at ambient temperature. He called this to the attention of supervision who, in turn, remedied the situation. As luck would have it, within the next hour, this solution was to receive a large quantity of parts...without the expeditor’s warning, there would have been a delay of at least a half-hour in waiting for the solution in this large tank to reach the required 190 degrees F temperature. When the employee was thanked for his prompt action in reporting this condition, he responded that he wouldn’t have noticed, except that he attended “that class on cleaning and I’ve been kind of noticing these tanks since then, now that I know what they’re supposed to be doing.”

A somewhat more dramatic result was realized in our overhaul department where, following the lecture on packaging, one of our inspectors initiated steps leading to a change from a rigid, costly package to one less bulky, lighter in weight, and less costly; yet still meeting the requirements of the packaging specifications.

People behave as if they seek to confirm their feelings about their own personal worth and competence. It must be recognized that many of the jobs in industry do not provide a maximum opportunity for the employee to attain a higher competency level. Worse, for those without strong competence needs, these conditions can, in fact, confirm a lack of competence. Because we feel that the classes we are conducting tend to increase the competency and personal worth factor of those attending, we plan to continue with them.

Staying in tune with a constantly changing industrial environment is a must in today’s competitive climate. Informal after-hours classes such as these do, in fact, appear to be one of the avenues available to encourage fellow employees to work at higher capability levels.
IF THE SHOE FITS
Continued from page 3

majority"; for most of today's causes are directly espoused by a minority of our population.

A Cause For Today
Today, we are faced with an energy crisis. The infamous "brownouts" and power failures of the past summers are said to be only a forerunner of future problems concerning electrical power. The shortages of fuel oil and natural gas during the past winter portend continuing crises in the winters to come. The rumors of possible gasoline rationing in the months ahead may be well-founded.

The requirement for greater electrical power consumption than our capacity to generate that power, can have an adverse effect on our industrial capability and our balance of trade. A short-term solution is improbable; a long-term solution is at hand.

The shortage of petroleum derivatives can react unfavorably in several areas. A lack of sufficient diesel fuel, gasoline and kerosene may cause both smaller crops to be planted, and problems in bringing crops to the market, intensifying our grain shortage and resulting in increased prices for grain products and meats. Should the supply of automotive gasoline be insufficient to meet demand, the mobility of our populace will be drastically decreased because of the nation's inadequate system of mass transit. Action was taken by our President in providing a short-term solution to the fuel crisis when he eliminated fuel import quotas. A long-term solution has been proposed, and will be discussed below.

Basic Problems
Each of the above-mentioned problem areas is interrelated. The bases for the energy crisis are the present under-capacity and underutilization of our crude oil production, and the apparent reluctance of the nation to utilize other available "fuels" to their fullest extent. The total solution to the energy crisis poses environmental questions. These questions can be, and have been, answered. Governmental agencies are in existence with broad control powers to ensure the protection of our environment.

The presently implemented, short-term solution to the fuel shortage poses serious long-term problems. When this nation is forced to rely on international suppliers and international waterborne transportation to provide the fuel oil which is vitally needed by our industries, internal transportation sources and general populace, we may eventually be faced with crude oil prices which further reduce the value of our dollar. Even more importantly, our fuel supplies may be curtailed in order to force our hand in the game of world politics. And, most important of all these considerations, our access to fuel can be cut off in the event of war or other world emergency.

The Roadblock
It thus becomes imperative that our nation take action today to effect a long-term and lasting solution to the energy crisis. A roadblock to achieving this solution is the thoroughly dedicated, perhaps misguided, group called the "environmentalists." While it is true that the solution to the energy crisis will impact on the environment, it is likewise true that this impact can be made minimal. And it should be apparent to all concerned that the vast majority of our populace is concerned with improving the environment in which we live. However, the choice between immediate solutions to the energy crisis and the environmental crisis (if there is to be one), must be ruled in favor of providing the energy sources which are urgently required to maintain the viability of our nation. Once this has been accomplished, we can all turn our attention to improving the environment.

Nuclear Power Discussed
In order to provide the electrical generating capacity that is urgently needed, without impacting further on our fuel shortage, action must be taken — immediately — to build major nuclear power generating stations. At the same time, planning must be started to convert our present oil-fired generating stations to nuclear power in order to reduce the amount of fuel oil utilized for power generation, and thus conserve our limited crude oil supplies. The roadblock which is posed concerning the possibility of nuclear accident is essentially non-existent. There have been no nuclear "accidents" in ship or shore station power plants to date, and none are anticipated. The minor problems concerned with temperature impact on rivers, used as the cooling media for nuclear plants, can be corrected by use of cooling basins and cooling towers. When compared to generating plants which use coal or fuel oil, atmospheric pollution can be reduced when generating stations are converted to nuclear power. We need a national commitment to utilize nuclear power in all future electric generating plants if we are to solve our power crisis in this country — and we need it now!

Solutions Proposed
The long-term solution to our fuel crisis depends on converting present major users of fuel oil to other energy sources, as described above; the immediate use of the major crude oil source discovered in Alaska; and the full exploitation of the present wells within our nation. The most cost-effective and rapid way to bring the Alaskan crude to our 48 contiguous states is by the proposed pipeline. There are environmental impacts to this solution; however, they can be minimized. The pipeline must be authorized now, with all possible actions taken, in conjunction with its construction, to protect the environment as far as is possible. The fuel crisis has reached such proportions that any further delay in starting the pipeline can no longer be tolerated. A side benefit of this Alaskan fuel use will be a major reduction in fuel imports, and an improvement in our balance of trade. At the same time, restrictions (public and corporate) on the exploitation of the present crude oil sources within our country must be immediately lifted. In the face of critical fuel shortages, limitations on pumping capacity of our present wells can no longer be tolerated. No quota system on pumping of crude oil should be permitted.

Government Involvement
It also seems that the time has come when the government must restrict the horsepower (or displacement) of automobile engines. There is no real need for private vehicles to be capable of traveling in excess of 100 miles per hour. More efficiency can be
COST REDUCTIONS and again COST REDUCTIONS are the topic of so many speeches and publications of today. What is not fully realized is the fact that we actually can achieve billions in savings yearly without a reduction in quality and/or quantity of our products and services; at the same time progress will be enhanced, all by revolutionizing the savings systems!

Former Secretary of Defense Laird stated: “We must study new imaginative ways to reduce the costs...” and former Deputy Defense Secretary Packard, as so many other high-level officials, doesn’t mind “calling a spade-a-spade.” Just recently, he claimed that much of our industry was very inefficient, had produced equipment the industry could not be very proud of, and that “the development process in the industry is so slow and inefficient that most new systems are out of date by the time they go into the inventory.”

Edgar Ulsamer, Senior Editor, Air Force Magazine, stated in a recent article that the “Pentagon, and presumably the White House, has learned to live with this prospect” of having the Soviet Union surpass us in terms of total defense-oriented technological capability, as Dr. Foster, the Director of Defense Research and Engineering had told Air Force Magazine. Mr. Ulsamer continues: “The only alternative, the Pentagon believes, is to make more effective use of the available resources.”

And Commander Robert H. Rossman, back from a two-day meeting of the Society of Japanese Value Engineers in October 1972, reports that our “recent efforts in fostering the use of Value Engineering/Value Analysis (VE/VA) in our country seem puny when compared to the total commitment for Value found in Japan. It was interesting to note the high percentage of value practitioners and value-trained personnel in each company as compared to the total company working force.” He concludes his report with the warning: “American management, AWAKE! You have yet to accept the challenge to your competence and ability. World markets are passing you by, and still you appear to slumber.”

These things do not bode well for America. Edison once lamented: “Atrophy of perception afflicts America today...Despite unquestioned vision of the fact, there is no sensing of it by the individual before whom it is placed. It is seen physically but not mentally.”

The warning voices ask us Americans to “shape-up” if we don’t want to perish. And we really can!

THE BIG QUESTION: What can we do about the described calamity?

The author, with extensive experience in the design and manufacture of products, and the management of new ideas in small- and large-size industry, in Europe and the USA, is convinced that things can be changed in a sensational fashion, based upon careful studies over many years. We actually possess the capacity and capability to increase real cost savings in government agencies and industry from a few hundred millions of dollars to a few billions per year, within, perhaps, a year’s time.

This would, however, require that our government act fast – apparently not easy to achieve – and that industry respond cooperatively, which is not impossible, if the government succeeds in removing the numerous roadblocks within and between its agencies and industry.

We also ought to stop quibbling about the purpose of Value Engineering compared to other helpful “features” like producibility, reliability, etc. Realizing that Value Engineering is supposed to (and can) teach the most efficient “creative techniques” for the solving of any type of problem, it also ought to be considered, like intelligence, as being something needed and useful for any type of endeavor, and not as an independent or separate entity.

What we are talking about here is the need for educating millions of employees in creative problem-solving, instead of thousands, especially in industry, where most of the cost of our products is created by millions of daily efforts of designers, draftsmen, and technicians.

We must revolutionize (improve in many ways) the controversial “Value Engineering” (VE) system, which was established and fostered in the beginning, in view of its promises, and then almost destroyed because of its failure to create the promised benefits.

Only lately can we observe a beginning revival. Some commendable progress in the desired direction has been achieved in the U.S. building industry and in some state governments. However, we will require many more advocates for creative problem-solving, like Congressman Larry Winn of Kansas, and Senator Jennings Randolph of West Virginia, in order to mobilize all available forces for our common cause.

WHOSE FAULT? As so often is the case, all involved contributed more or less to these deplorable results, even the VE teaching material. So many psychologists and practitioners of VE, many of them not selected by their organizations with sufficient consideration of their education and talents, unjustifiably felt an urge to become
known “experts” in the field, and complicated — unintentionally — creative problem-solving. They invented schemes, most of them of little or no interest (or value) to those who were expected to adopt them.

VE practitioners often became their own worst enemies by forgetting to apply their teachings to their own dealings with others. Formalists and formalism became more and more dominant, and this is the arch enemy of creativity, and of those who are gifted with this highly valuable talent. Simplicity, and not complexity, should be our common goal. Even a technique of theoretically high value is useless if nobody either recognizes or applies it.

WHAT IS NEEDED — and also available — are relatively simple techniques which are convincing, easy to teach and to handle, and easy to adopt by the majority of employees, for simple tasks as well as for complex ones.

Many small improvements — the millions of little steps, taken by millions of people in their daily work — accumulate far more savings than the relatively few high-cost items, which is the target of VECPs. Naturally, the latter should not and would not be neglected by the suggested change; to the contrary, they would increase, too, in number and total value, once creative problem-solving has been established on a wider basis.

WHAT NEEDS CHANGING? In more detail, it appears necessary to consider the following conditions, which beg for a change:

1) VE Courses — In short: (a) There are a number of worthless, misleading or faulty “schemes” publicized and taught, which produce detrimental effects on the “students” and management of organizations. (b) Many things which are called “new,” are not. (c) Too much emphasis is often placed on “group brain-storming” and too little on other valuable techniques. (d) There are courses in VE, exercising VE on one object only, which waste much time without creating a worthwhile benefit. (e) Employees are usually only instructed in a course, scheduled over one or two weeks’ time, instead of over several months. It should be noted that something as dangerous to each individual as smoking, takes more than one discussion, in order to achieve a permanent change of habits. [Points (d) and (e) make it difficult to create the needed “change of thinking” habits, even if the substance taught were satisfactory.] (f) Too much emphasis is placed on VE team work. Too few realize or learn how to do creative problem-solving when working alone, and how to apply it to their daily tasks.

2) VECPs — VECPs alone can deal only with a small fraction of potential savings: This emphasis on VECP’s — without sufficient emphasis on other VE work — causes companies to teach and apply VE on a limited basis only, to a relatively small number of their employees, leaving the great majority of existing potential savings untouched.

3) VE Team Work — Whenever it is required in complex cases, the commonly used methods of assembling and working with a team are unnecessarily wasteful of time and money. It would take too much space here to explain all the reasons for this statement, and to describe a more efficient, less expensive way of handling team work. Details about a far superior method are explained in the publications which are listed at the end of this article.

4) Selection of Course Participants — The lack of understanding of creative problem-solving caused many organizations — quite understandably — to spend relatively little effort and money for the discussed education. On this basis, it is also plausible that this effort has often been concentrated on middle management. Too little has been spent on the education of the “working level” within organizations, which also includes many “hourly” employees. The latter are often more creative than the “educated,” since they are not so much misled by a formal education in their way of thinking. Even Einstein complained about this negative effect of formal education. He stated: “Imagination is more important than knowledge.”

5) Employee Suggestion System — Each large organization has had such a system for years. However, most of these organizations do not yet realize that the amount of actual cost savings can be increased considerably by the use of full-time, well trained evaluators, who will contact the respective superiors, responsible for the item under study, in person, if a suggestion has a sufficiently high potential value. Sending suggestions for evaluation by company mail to a superior is inadequate for several reasons, and results in a lesser number of accepted suggestions, a lower amount of savings per year, and a greater dissatisfaction among employees, which in turn results in a reduced willingness to submit suggestions.

6) Treatment of the Highly Creative — With the described low-level interest and relatively low efficiency of education in creative problem-solving, it is no wonder that the highly creative persons in an organization are not properly recognized and put to work effectively. It is not yet understood that the highly gifted and experienced, creative individual can outperform the “experts” in many fields, although he may not be familiar with the subject at hand at the beginning of a task. He can often produce a better solution in a fraction of the time that the “experts” had spent in vain. This fraction can be one-tenth — even one-hundredth — and occasionally can be less than that.

CONCLUSIONS

All this should be sufficient to indicate many of the problems which keep us from saving all those urgently needed dollars — the billions — many high officials think we ought to be able to save, but don’t.

This author is not talking about saving billions by cutting desirable programs; he claims that billions of dollars can be saved and made available for other purposes by designing (or more generally expressed) by solving the uncountable number of small and big problems in a simpler, more efficient fashion, without sacrificing desired qualities or values. It is possible!

Details on the discussed subjects are described in the following publications: “More For Less!” This publication outlines how to organize for higher gains through creative problem-solving; and “Effective Problem-Solving,” an item which tells individuals and teachers how to become more creative, using simple, easy to learn techniques.

These two publications are available from: American Cost Reduction Company, 1923 Veteran Avenue, Los Angeles, CA 90025.
The Concept of Negative Feedback

Negative Feedback is a form of communication which is a reaction against the current status quo. This reaction, a disagreement with the current method of operation, comes from those involved in the system with which they disagree. The disagreement can be as strong as a feeling of total abhorrence for the system. Any interest in making improvements is an act of changing the current operating procedure and therefore, is negative feedback.

The attitude of the organization towards this type of feedback greatly effects the rate of growth of the organization. A system which suppresses the flow of negative feedback limits itself by refusing to acknowledge and evaluate the criticism it receives. It restricts the path of creative new ideas and forces its members into a mold where anything but the conforming, apathetic action of agreement with current methods, is out of place. By the same token any system or organization which remains open to both dissent and new ideas tends to profit from the creative influx of improvements which originate from within itself. In order to maximize this effect, negative feedback should flow freely from all levels of the organizational structure. The entire system participates and becomes, to a certain degree, involved in determining the route by which it shall obtain its goals.

The application of the idea of opening a system to participation and involvement through the use of negative feedback is one which has great potent as well as many implications for the business organization. This concept is contrary to the mode of thought currently used by most business organizations in that it does not support the premise that the superior is the absolute authority in all areas concerning the subordinate’s task. Even though the traditional superior-subordinate relationship is broken, a correctly implemented negative feedback system will facilitate
greater employee loyalty, and lead to fuller interpersonal relationships for all involved. Such relationship develops primarily because the negative feedback system requires that the subordinates and managers take a greater interest in each other's problems and ideas. This leads to a mutual feeling of concern and to better interpersonal relationships.

The Relationship Between Participation and Motivation

The process of employee participation in decision making is one which, by nature, tends to increase motivation and lead to greater involvement with the work. This is exemplified by the study done in a pajama factory in which changes in the working process were introduced to form groups in different ways: one group using participation through representations; two groups using total participation, and a control group with no participation whatsoever. The changes were minor in nature and were compensated for in the measuring. The results showed that the experimental groups relearned faster and produced at a rate 14% higher than before the change. The groups with total participation submitted more useful suggestions for improvements than did the group with only representative participation. Also one fifth of the control group quit within forty days of the change.1

This example shows how participation in decision making eases the effect of both achievement and group pressure to create an atmosphere of greater effort and productivity.

The Effect of Achievement on Effort

The inclination for group cohesiveness and identification with goals which comes from employee participation is derived from two basic principles. The first of these states that "participation may create the opportunity for the individual to get a sense of personal achievement from reaching the goals in his work."2 This sense of achievement is most important in the roles which form an important segment of the self-image of a person. The more important a person's role at work is in his self-image, the more important achievement at work will be. The extent to which achievement of specific work goals is important is a factor of the general need for achievement in proportion to the extent to which both this need is related to work and the specific work goals are accepted as an important part of the work role.3 In this, the first two components are determined by the individual's personality. The setting of specific work goals can be done through participation in decision making and can lead to an increasing importance of the work goals in the work role.4

The Business organization will find the need for achievement important only if greater effort, and therefore, greater or better production on the behalf of the employee is the method by which its need for achievement can be satisfied. Effort will result in achievement only when various factors are present. A clear standard of good performance which involves social comparison should exist and reports on the employee's performance should be given to him. The work task should provide a challenging degree of difficulty, and the employee should have control over the means by which he reaches the goals. This control gives the worker a sense of personal responsibility over the level of achievement which he obtains.5 This control can be given to the employee either directly by allowing him the freedom to choose and evaluate his method of operating each time he performs a certain task, or indirectly by allowing and encouraging him to suggest methods of improving the operating procedures. These methods are then evaluated by a qualified board and put into effect if approved. The more directly the control is given the greater the individual's sense of personal responsibility towards his success or failure, and hence

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1Floyd L. Ruch, Psychology and Life, (7ed; Atlanta; Scott, Foresman, and Co.: 1967) p. 566.
2Ibid., p. 29.
3Ibid., p. 30.
5Ibid., p. 28.
the greater effect his effort will have on his achievement.

The Effect of Group Pressure on Effort

The second of the basic principles mentioned above states that "participation may lead to identification with the organization, which makes the individual more sensitive to social pressures from the organization members." When an individual participates in decisions that affect a group or organization to which he belongs, he comes to identify more with the organization. His organizational role becomes more important as the amount of participation increases. This leads to a greater sense of status and more susceptibility to approval by the immediate group. When this group has norms that require good performance and work towards the organizational goal, the individual will be forced by group approval to also work for these goals. As a person moves to higher managerial positions the effect of group approval tends to lessen and the effect of status increases. The motivation to organizational goals is higher at the upper status levels of the company.

The motivation required to work hard in order to be approved by the group is a function of not only the extent to which acceptance by organizational unit is an individual's goal but also the extent to which doing a good job is perceived to lead to approval of the individual by the group. Participation plays an important role in both of these factors and thereby also greatly influences the motivation of the employee.

Business Programs for Participation

An employee participation program can function as one of the best basic tools by which management can move the company towards its goals. This program can not only help the management to reduce costs and improve employee relations, but also improve working conditions and produce a better product or service.

A well developed system affirms the importance of individual effort and takes advantage of the bank of knowledge that the employees have. Such a system assumes that the man participating in an inefficient industrial process is in the best position to suggest what can be done to remedy it. This was expressed by Dr. Haber, Professor of Economics, University of Michigan, when he stated in an address:

"Today people have ideas, and better ones because they are better educated and more involved. In another five years we will have four million people in junior colleges—people who are work-oriented—and who will be working in our plants after 14 years of schooling."

This seems to indicate that the constructive trend will be for management to recognize that each employee is somewhat of an expert at his particular job and can intelligently add suggestions for improvement of his performance.

The programs of employee participation in decision making take different forms at the various levels of the business organization. At the lower levels of the company, those involving the ordinary employee, the participation usually takes the form of suggestion systems where ideas for improvement are submitted to committees of capable workers and supervisors for approval. This method holds especially true in the company which has many employees working on a single process all using standardized procedures, since the actions of every individual are closely related and changes in method effect the entire process. When considering either companies with fewer ordinary employees or people in the higher levels of management more freedom is given the employees as to the methods which they decide to use. Managers generally participate more by helping to make policy decisions rather than through suggestion systems. The higher the level of the manager the more important the decisions he is allowed to
participate in. The styles of both policy making participation and suggestion system will be discussed later in this paper.

Objectives of a Participation System

The arms of any participative management system can be best categorized by three types of objectives. These include those objectives which are tangible in nature, those intangible, and those which lead directly to the facilitating of administrative techniques rather than end results.14

Tangible Objectives

Tangible objectives are the most easily measured and are often used to justify the use of employee participation. The objectives include using the system to generate a source of monetary savings through increased efficiency, cost reduction, or increased output.15 This type of system provides for the maximum use of a reservoir of constructive ideas that might not be otherwise available to the company.16 Acknowledgement of approved suggestions helps provide the system with the aim of being a public relations media. Other tangible objectives include the discovery of employees who have good potential for advancement, and providing the employees with a fringe benefit, allowing them to increase their earnings by rewarding those suggestions which are adopted.17

Intangible Objectives

Intangible objectives involve the alteration of the employee attitude and attempt to improve the manager-subordinate relationship. Participation systems attempt to improve the morale of the employees and industrial relations, and attempt to increase job interest among the workers. Closely related to these goals is the hope that these systems will serve as a medium of two communications between employee and management, and provides for a constructive and positive attitude for improvement.18 Improvements involve change, and it was shown in a study by the English Ministry of Labor in 1966, that one of the two major factors affecting workers acceptance of change was the attention that management paid to employee suggestions.20

Once the communication path is unclogged, the interaction between managers and subordinates tends to render a feeling of group unity and cooperation, and builds a spirit of teamwork. This is especially true when both groups serve on the same committees evaluating proposed policies and suggestions for improvement. One of the hopeful results is the improvement of safety and working conditions. Many participative systems are also designed to serve as a medium of employee training. By serving on investigation and approval committees the employees gain a more thorough understanding not only of their job but also of the company’s entire operation. In this way, the program serves as general training for promoting the employee to a more responsible position.21

Aiding Administrative Techniques

Employee participation systems also have several objectives which deal with improving administrative techniques and explain why a company acts rather than emphasizing any end results. Through these systems management attempts to provide an incentive for employee thinking. At the lower levels of the organization the incentive of cash awards has the most effect. As the organizational level rises recognition and promotions in status become a greater incentive than money. Business programs of this nature also have the object of providing channels for ideas, and means of recognizing and rewarding those who help improve the operating methods. At the same time participative systems assure that thorough consideration will be given to all ideas.22 In this way both managers and workers will keep their minds open to new and better procedures and methods of operating.

—END OF PART ONE

PERFORMANCE
JOHN K. MILLS, JR. was recently named vice president of the mailing equipment division of Pitney Bowes at the business systems and equipment company’s Stamford headquarters.

Mills began his career with Pitney Bowes in 1941 as a cost statistician, and held a series of jobs in purchasing and personnel before becoming assistant to the executive vice president in 1951. In 1955 he was named assistant to the vice president of manufacturing, and in 1963 was appointed director of manufacturing services. Four years later, Mills became general manager of assembly operations, and in 1969 was named vice president for manufacturing in the company’s mailing equipment division. He is a graduate of Princeton University.

The role of middle management is attempting to influence how people think. What we are talking about, of course, is not really how people think at all. It’s how people act. Because whether you supervise a manufacturing production line, a busy office, or a solitary clerk-typist, in varying degrees, your job in middle management is extracting from others the best possible performance. The only reason that you need to care about what people think, from the standpoint of your job, at least, is because what they think inevitably is the major force governing how they act.

We all know that we can go only so far in influencing the actions of others without persuasion, without motivation, and without coming to terms with the fact that, to manage people, you must address yourself to what people think. Certainly, to an extent, we can and do require a certain kind of behavior. We can institute rules, set minimum quotas, establish minimum standards below which some sort of penalty or disciplinary action will be applied. We can, in short, use the stick to keep the performance of the people we manage from dropping below what has been established as the lowest possible acceptable level.

But above that level of performance, between the lowest level of performance that we can accept and the highest performance that these people we manage are capable of, is a vast range of achievement levels that are relatively unaffected by our use of the stick. To travel into this area, to bring the people we supervise above the bottom line of what we can tolerate into the upper reaches of what we can hope for — and should be aiming to achieve — we have to rely much more on the carrot than the stick. We have to make people want to perform better for reasons that go beyond their fear or apprehension over the consequences if they should fail to meet the minimum requirement we have laid down for them.

The carrot, of course, takes many forms. The road to increased employee productivity — and no matter how you slice it, increased productivity is our ultimate goal as managers — is not lacking in complexity. We are all aware of the increased emphasis being placed on productivity these days as the only real answer to many of our problems: (1) As a means of strengthening this nation’s economy and improving its position in the world marketplace; (2) As a wedge against the continuing inflation that has plagued us so persistently; (3) As the best possible route to improved profitability and greater economic stability for the individual companies we work for. Once you have cut your way through all the rhetoric that has filled the air on the subject, you can come to only one logical conclusion. Any gains that are to be made will not be the result of edicts issued in Washington. They will be made because our companies, through us as managers, work smarter and more efficiently — and that means more than just working harder and faster. No, to improve productivity we must work smarter and more efficiently...and we must teach, inspire,
motivate — use whatever word you like — the people who work for us to do likewise.

What are some of the carrots through which we can achieve better performance from our people? There are some fundamental factors that will directly affect performance, of course.

Like training — you can’t expect a man, or woman, to perform to anywhere near his potential until you have taught him how to do his job. Training is time-consuming, and it isn’t cheap. But done well, it pays for itself.

It goes without saying that fair pay and good fringe benefits are necessary ingredients. We’ve got to have them to attract good people in the first place, and we certainly have to have them to keep these people once we have them on the payroll.

Equally obvious is the necessity of providing our employees with the tools and equipment they must have to operate efficiently. And we’ve got to design some of the boredom and tedium out of jobs if we are to expect people to perform with any degree of enthusiasm.

A decent work environment is necessary, too. People expect more of their work environment these days, and they have a right to. With the progress that our society has made in improving the quality of life, you couldn’t expect otherwise. We have to pay more attention to removing or reducing the negative influences in the work environment — noise, dirt, excessive heat, and the other factors that silently hack away at an employee's efficiency.

Even more important, we’ve got to make sure that we make it possible to gain, to improve himself personally, through his own effort. A profit-sharing plan, such as Pitney Bowes has had for many years, is one way of accomplishing this, at least partially. It makes it a lot easier for the employee to relate his own personal economic welfare with the economic welfare of the company when his income is directly affected by the company’s profitability. Incentive plans, something else we utilize at Pitney Bowes, can help, too. Beyond that, we have to make sure that an employee has some degree of hope that if he applies himself properly he can advance himself in his job. That merit — not favoritism — is the governing factor in promotions, and that greater personal reward will not be denied him because of the prejudice or faulty vision of an individual supervisor or manager. Fair treatment of all employees, consistently applied, is an absolute must.

Equally important is communications. Communications, in my company and I’m sure in yours, takes many forms. We have employee publications, and letters, and bulletin board notices, and meetings, and a host of other methods of communicating with employees. And they are all important. How important is impossible to measure, but I think most of you will agree with me that communications — as a means of making our employees knowledgeable participants in an endeavor, or cause, that they can identify with — is probably one of the single most influential factors in how a person feels about the work he is doing and how he applies himself to it.

The middle manager has always had just about the toughest job in the business world. Although at some companies the situation may be improving, he has always been — and still is — the man in the middle. He is below the level where most of the big decisions are made, where most of the goals that he is expected to achieve are set. Yet he is the guy who is held accountable for meeting these goals for getting the work out. It has never been an easy job. And it’s tougher now than it has ever been. The people that the manager has to depend upon to get the work out are part of a new breed. That weekly paycheck is no longer enough, if in fact it ever was. People today are more concerned with what they are doing with their lives. They have moved past the stage of simply worrying about whether or not there was going to be enough food on the table. They need to know that what they are doing is worthwhile, and they need to know that someone recognizes the part that they as individuals are playing in getting the job done.

This doesn’t change your job — it just makes it more difficult. It makes it more important that you communicate with your employees as individuals and that you invite, or better yet, that you encourage them to communicate with you. It makes it more important that you give them the feedback — as individuals and as a group — that they need to know how they are measuring up in terms of meeting their own individual and group goals.

People can’t operate in a vacuum. They need to know where they stand, and how they’re doing. The middle manager has to condition them to look to him as the source of information about the company, and about the status of the work group they are a part of, and about their own jobs. If you try hard to serve in this capacity, and if you are successful, the people you are responsible for will look to you for this information. They will ask you questions — probably a great many you may not have the answers for. But if you’re doing your job, you’ll make it your business to find out. You — and how you do your job — are the key that will make the difference between people who are doing a certain job simply because it is required of them and people who are true participants — who put a little something of themselves into their jobs every day, and who have a sense of fulfillment as a result.

One last bit of advice which is valid for members of management at any level: believe in your people. We are surrounded, all of us, by examples of men and women doing mediocre work, and I am convinced that 99 times out of 100 the reason for this mediocrity is that somebody upstairs has decided that this is the best that these people can do. They are operating at a certain level below their potential because they are not expected to do more. As the German poet Goethe said more than a century ago, “Treat people as if they were what they ought to be and you help them to become what they are capable of becoming.” Believe in people, believe that they will succeed — and without being a phony about it, communicate that belief — and you will be doing more to ensure their success than just about anything else you could do.

While you’re at it, don’t forget to believe in yourself and in your ability to influence the people you are responsible for and to help them to reach the levels of achievement and rewards they are capable of.

Because if you work at it, you can do it, and both you and your people will be the richer for it. And, in the process, you will be fulfilling your major role as a member of management.
Planning Your Publicity and Promotion

By Wallace H. Egbert

The people who have something to sell advertise. Radio, newspapers and T.V. all exist on revenue from the publicity and promotion the businesses put into their product sales programs.

In a way, the Suggestion Systems are similar; they must be enthusiastically promoted. Without publicity and promotion they will soon lose their appeal and fold up.

One of the major criteria for a good Suggestion System Manager is his flair for publicity and promotion. Unfortunately, some companies have experienced a failure with their programs because the Suggestion System Manager was a good clerk and a fine cost-saving analyst, but a poor promoter.

What then are the criteria for good Suggestion System publicity and promotion? In the recent Suggestion System Regional held in Evansville, Indiana, and attended by Suggestion Managers from all over the state, this topic was discussed. Some of the most valuable thoughts on this subject form the basis for this article. The discussion comments can be categorized as follows:

A. Needs for publicity
B. Types of promotion
C. Scheduling of events
D. Budget

Let's take a brief look at these comments and perhaps they can be of some help in appraising your Suggestion Systems publicity concept.

A. Needs

The term “needs” was defined as situation or status of program, with emphasis placed on correcting weaknesses. The group listed some basic needs:
* Participation too low.
* Quality of ideas too poor.
* More recognition for the evaluators.
* Top Management support.
* Reaching levels of employees.
* First-line supervision not interested or defensive.
* Slow processing time.
* More use of community news services.

The list presented at the Regional was much longer. However, from these it could clearly be seen that looking at the needs of the program could cause some realistic goals to be set around which a whole year’s or more publicity could be built.

When we ask ourselves, what are we going to promote for, i.e., more suggestions, higher awards, etc., we are actually analyzing the Suggestion System weaknesses. This is good for any system; even the better ones can benefit from this kind of appraisal.

B. Types of Promotion and Publicity

It was most interesting to observe the group at the Regional approach this phase of the topic. Here are some of the comments made before the conference leader gave his views on types of promotion:
* House organ
* Bulletin boards
* Newspaper
* Radio
* Posters
* Gimmicks (pens, pencils, lighters, etc.)

All of these are good and are necessary to carry out a publicity program. It seemed the group had not really grasped the full meaning of the term “types.” The conference leader then gave some interesting comments concerning types of promotion:
* Publicity or promotion for a specific goal — short term.
* Maintenance of program to standards — long term.
* Attention getting promotions for specific levels of employees — (clerical, production, first line management).
* Special publicity for installation.

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From 1957 through 1964, Mr. Egbert was a National Director of N.A.S.S. and was elected president of the Association in 1964.

Mr. Egbert has published numerous papers on cost reduction programs, suggestion programs, and creative thinking.

He also holds the distinguished “Founders Award” presented to him at the N.A.S.S. Conference in 1971.

Mr. Egbert is Manager of the Suggestion Award Plans at Mead Johnson & Company, Evansville, Indiana, whose program has been the recipient of the Overall Performance Award for six years and is rated as one of the best programs in industry.
of a new or revised system.

Here again the list was quite lengthy. It can be seen that the types of promotion relate directly to the first part "needs."

Some excellent examples were shown illustrating some of these types. For example, a company had experienced a period of rather poor safety records. To get all employees quickly aroused to the need of becoming safety conscious, a special one month safety campaign entitled "S.O.S." — "Safety Observer Spotted." With posters, check stuffers, letters, etc., the program was promoted. We should also mention that some attractive awards were presented. The results were outstanding. The company had 318 employees; 214 participated; 254 suggestions were submitted of which 187 were accepted, in that they caused action to be taken to improve or eliminate a hazard.

After some of these examples were shown, the group revised their list on "types" and it looked like this:

- Participation emphasis promotion
- Supervision involvement promotion
- Fire prevention campaign
- Safety slogan contest
- Vacation theme program
- Suggester-of-the-Month and Year
- Supervisor-of-the-Month and Year
- Awards presentation

This soon lead the group to see that it is far more important to plan your publicity and promotion than to just put up a poster. It is most important to select a specific type of publicity to accomplish a goal or to fulfill a specific need.

Unfortunately, all too often when a need is realized, it is so urgent there is not enough time to adequately plan and implement the type of publicity which will meet the need. It is, therefore, wise for a suggestion administrator to be constantly aware of the status of the program and to forestall weaknesses by good, long-range publicity planning.

C. Scheduling the Publicity and Promotional Events

Proper timing of publicity and promotional events will pay big dividends. It is not too early to begin planning and scheduling your events for 1974 right now.

In the discussion of this topic almost everyone present realized that proper planning was not being done. After considerable discussion, there were some very basic laws established. These they listed as follows:

- a. Plan your publicity before making your budget requests.
- b. Schedule the publicity at a time to be sure that need for it will be realized.
- c. Plan ahead with variety. When one publicity program is finished, the other should begin.
- d. Plan publicity so it will coincide with the company's operations and programs and not conflict with them.

Let's take a moment to look at one company's suggestion publicity and promotion program for a full year as related by their Suggestion Administrator.

1. Beginning on January 1, the program provided for a participation gift for the first idea submitted by each employee.
2. Posters for specific emphasis were prepared and placed on the suggestion bulletin boards every other Friday. A total of 25 were made.
3. Each month the best suggestion completed and installed received the Suggester-of-the-Month Award. This was a 20% bonus on the award with a minimum of $25.00. The suggester's supervisor was named Supervisor-of-the-Month and received a bonus of 15% of the first year's savings on the suggestion.
4. Safety program in the suggestion system was scheduled the second week in the second month of each quarter.
5. Vacation and leisure time publicity was scheduled in July and August.
6. At the close of each year, the employee with the most acceptance, highest total of awards, and most submitted ideas receives a $500.00 bonus. Likewise, the first-line supervisor who promoted the program the most during the year and showed the greatest gain in participation, highest number accepted, most valuable ideas receives the Supervisor-of-the-Year bonus of $500.00.

This example does not necessarily reflect a model publicity program but it shows careful long-range planning with emphasis on quantity, quality, and participation as well as gaining the support of first-line management.

This administrator listed some of the items he used in his publicity program.

- a. Participation gift — credit card case and billfold. The gift was in an attractive box with a card that read, "We hope to be able to fill this billfold with cash for you this year."
- b. Check stuffers at the beginning of each new publicity program.
- c. Posters made by using clip art.
- d. House organ stories of publicity and promotion.
- e. Pictures of suggestion winners on the bulletin boards.
- f. Dinner for the top 25 suggesters, their supervisors, the suggestion committee and the head of each division.

D. Budget

When you see such an elaborate program, you are bound to ask how can a business afford such expenses? The group at the Regional batted this around for quite a spell and here are their conclusions:

1. The program results are directly related to the amount of publicity. Therefore, from 20 to 30% of the total budget should be allocated for publicity.
2. Total program should produce at least 4-1 measurable savings over expenses. Reviewing past year's performance should give the Administrator some guidelines for the amount to set aside for promotion.
3. When sudden needs become apparent the Administrator should be authorized to get budget variance so program activities will not falter for the greater part of a year before corrective action is taken.

To our readers we say — this is not an all inclusive publicity and promotional guideline. It was presented to arouse anew the fact that most programs fail because they do not get proper attention and publicity is a key factor in any program.

If we have made you stop for a moment to appraise your publicity and promotional part of your suggestion system, then this article has served its purpose.
DEWEY A. SHERAR is Manager of Quality Assurance and Test at the Wasatch Division of Thiokol Chemical Corporation. He received a degree in Mechanical Engineering from the University of Southern California, and a Master's Degree in Business Administration from Utah State University. Mr. Sherar has nearly 20 years of quality assurance experience.

QUALITY AWARENESS IN AEROSPACE

By Dewey A. Sherar

Quality Awareness Program — three words that usually produce more than their share of moans and groans and half-hearted motions. Yet it doesn't have to be that way. A QA program conducted at the Wasatch Division of Thiokol Chemical Corporation was well-received throughout the plant — from top management who bought it and backed it, to the operators on the production line.

Need

Thiokol quality has always been excellent. Production of rocket motors for space and defense requires the strictest attention to product quality. (There is no chance to recall defective Minuteman missiles if they don't work when they're supposed to. So they have to be built right.) Thiokol quality practices, therefore, are well established and very demanding. However, in early 1971, two new variables were introduced into the quality matrix.

First, the company began production of the third stage motor for the Minuteman missiles. Thiokol had produced the Minuteman first stage since the early 60s with an impressive record of success. But now we faced a whole new set of blueprints, procedures, and tooling.

Secondly, to staff the Minuteman production lines, as well as various other new programs, Thiokol/Wasatch began hiring new employees at a rapid rate. Although quality was emphasized in the training programs, the new employees' basic unfamiliarity with space age components made it difficult to communicate exactly what standard of quality was expected. To tackle these potential problem areas, several basic decisions were made, as follows.

Plan

The QA program had to be intensive. A few slogans pasted on bulletin boards and half-hearted commitment would not do. (Such efforts usually produce the counter-productive “another damn campaign” attitude.) A genuine quality consciousness needed to be stimulated throughout the plant to improve and encourage quality work and quality products.

Program

Fortunately, top management at the Thiokol Division had always strongly supported quality goals. After a briefing on the potential problems, management was receptive to the idea of an intensive QA program. In a series of meetings with management at all levels, quality at Wasatch was thoroughly discussed, potential problem areas were spelled out, and suggestions for specific things the program should do were solicited. The meetings served to make the need for a QA program obvious; management involvement in the early stages assured the kind of support the program would need.

The first step was to create a quality consciousness among all employees through a rather comprehensive communications campaign. A letter pointing out how Thiokol's business depended on quality was sent to all employees by Vice President and General Manager James M. Stone. All other company media — bulletin boards, the PA system, the newspaper, and news bulletin — were used to carry the quality message. But the communications effort was not allowed to degenerate into a sermon.

As foremen carried the quality message to their workers in informal discussions, the media communications effort reinforced what the foremen were saying. It further demon-
errors caused by operator carelessness, those quality problems that occur outside the domain of the operator had to be approached.

A major step was to make management aware of the large percentage of quality non-conformances that fall outside the realm of operator error. Once this was done, management was eager to make those contributions they could to improve quality. New procedures were written, for example, and more effective inspection processes were devised.

Wasatch vendors were also asked to participate in the QA program. Because of the complexity of aerospace business and the need for technical superiority in nearly every part, a large number of components used in Thiokol rocket motors are supplied by vendors. Quality non-conformances here could undo all the care and quality consciousness of the rocket motor manufacturer. So a series of meetings was initiated where the major suppliers were briefed on the need for quality concern by them. The emphasis of the meetings was obvious—Thiokol's future and their future as a Thiokol vendor depend upon continued manufacture of quality products. The vendors were receptive to what Thiokol spokesmen had to say and appreciative of their frank tone.

Perhaps the single most important aspect of the QA program, however, was the establishment of a new management tool to keep track of the direction of quality at Wasatch—Quality Analysis Reporting (QAR). In the past, quality non-conformances were broken down to the departmental level. With QAR, quality performances were defined one level farther down, at the second level. The number of non-conformances and the cost of these non-conformances were listed monthly. These data were put in the hands of the foremen. And those foremen who previously had thought they were not contributing much to a quality problem now were made aware of exactly the amount and nature of their contribution. Most of them were surprised.

With these data in his hand, the foreman is now in a much better position to take corrective action for specific practices. He can install a greater quality awareness in his workers or he can more closely examine the causes of non-conformances. For example, before QAR many non-conformances were attributed to operator error and left at that. Now, with the information made available to him, a foreman can check to see if operator error was the real cause. Many times it is not. And thanks to this kind of investigation of quality conformances, the real source of problems is identified and effective corrective measures are taken. Often improved procedures are written or superior tooling provided the operator.

Further, QAR serves as a psychological aid in stimulating improved performance. Because every section has a record of its quality performance, every section can set its own improvement goals. The QAR also serves to encourage a spirit of competition between sections.

QAR can be misused, however, if it becomes merely a punitive measure to pin the blame for a non-conformance on an acceptable scapegoat. This is counterproductive and Thiokol has taken pains to avoid this. The QAR system keeps everyone informed about the exact quality situation throughout the plant and it enables management to determine where corrective, not punitive, action is needed.

Results

Without question, the QA program has had a significant impact at Wasatch. Quality Analysis Reports have been kept since the beginning of the program and they show a definite decrease in both the number of non-conformances per manhour and the cost per non-conformance.

The QA program also had its impact on Thiokol QA inspectors. Inspection procedures have stiffened. Nonetheless, the number of non-conformances are decreasing even with increased inspection surveillance, and in spite of increased employment and increased production.

And because QA has been established as an on-going program, the quality message at Wasatch will continue to come through.

IF THE SHOE FITS
Continued from page 31

designed into engines which have the capability of propelling an automobile at a maximum speed of 75 miles per hour (or less). The continued trend toward bigger and more powerful automobiles must be reversed if we are to overcome the blatant waste of gasoline that is part of today's automotive scene.

A major government-sponsored effort should be started, concurrently, to evolve methods for reducing the amount of fuel oil needed by other major users, such as through the electrification of our nation's railroads (by nuclear-generated power) or, perhaps, the use of magnetic or electric energy sources for automotive power on our major highways. A major benefit of these conversions would be the reduction of atmospheric pollution.

Dedication And Commitment

The small, vocal cadre of environmentalists, which has delayed the use of nuclear power and the construction of the Alaskan pipeline, has served a useful purpose by ensuring that our citizens and leaders are aware of the environmental impact of the actions which are now urgently required. As active and interested Americans, this group should now direct its attention to assisting our nation in expanding the use of nuclear power and bringing in the major supply of Alaskan crude, while taking all possible actions to protect the environment. They must become dedicated to the solution of the energy crisis to assure the continued excellence that is America, and then turn their attention to the effort previously described to convert major fuel users (and polluters) to other sources of energy.

A concern for environment requires that we have a vital and viable country in which we can be concerned about things such as the environment. The energy crisis must be solved first; then there will be time and energy to expend on other crises. Americans must become completely dedicated to the causes of solving the energy crisis at the earliest possible time.

(The opinions and assertions contained herein are those of the author, and are not to be construed as official or reflecting the views of the Navy Department.)
BY JOHN W. SCHMITT

THE UNION
AND THE
SUGGESTION SYSTEM

JOHN W. SCHMITT is president of Wisconsin State AFL-CIO which represents nearly 300,000 labor union members. The state organization is affiliated nationally with the American Federation of Labor-Congress of Industrial Organizations (AFL-CIO) that represents nearly 14 million American workers.

Schmitt was elected vice president of the State AFL-CIO in 1960 and served in that position until he was elected president in 1966. He was re-elected to that position at the 1968 and 1970 biennial conventions of the State AFL-CIO.

A native of Milwaukee, Mr. Schmitt has been president of the State AFL-CIO since 1966 and was vice president for six years prior to that. He became active in the labor movement soon after joining Milwaukee Brewery Workers Local Union 9 in 1946; he served the local as a steward, committeeman and executive board member and was named business agent in 1952, a position he held until 1960.

He has been particularly active in the field of education and has served on the advisory committee of the Governor’s Commission on Education; advisory committee of the University of Wisconsin School for Workers; policy board of the State Vocational, Technical and Adult Education Board; the policy and advisory committee of the State Apprenticeship division, and on other boards responsible for establishing educational policies.

While I will discuss “Unions and Suggestion Systems,” I must confess quite frankly that I would feel much more at home discussing something like Unions and the Grievance Procedure.

As you can understand, that is a field of activity in which I’ve had a great deal more experience. However, on second thought, I decided that an effective suggestion system and an effective grievance procedure have some important things in common.

Both can and should contribute substantially to the success of a company’s operation. Some of you may raise your eyebrows at this comparison, but I believe that I can demonstrate that it is valid.

The success of both the suggestion system and a union grievance system depend upon the same factors—the understanding, confidence and cooperation of the employees or union members with management.

For this reason, we have found it essential in developing member understanding, confidence and cooperation in our grievance procedures. You can judge whether they apply in the development of an effective suggestion system.

First, it is necessary to explain how an effective grievance procedure can and does serve the company in much the same manner as an effective suggestion system.

The purpose of the suggestion system is to tap the knowledge, the ingenuity and the initiative of the entire employee group for the benefit of the company. Under the suggestion system, management takes the initiative in soliciting its employees for their ideas on how to make the organization more successful.

Companies reward employees on the basis of the value of their suggestions. Just as important, it rewards them psychologically by recognizing that they have the ability to contribute more to the company than is required in their regular jobs.

In theory, at least, the suggestion system must be considered a very good idea from both a practical and human standpoint. It can bring profitable, cost-saving ideas to a company. It can improve employee attitudes and morale by dignifying them and recognizing their full potential.

I say “in theory,” because not all company suggestion systems produce the same results. Why is there a difference in the results of suggestion systems? Here is what we in unions have found that makes our grievance procedures most effective.

The grievance procedure or system is established and maintained by the union to provide its members with an effective means for registering their objections to company policies, practices and management actions.

While its purpose is primarily to serve and protect a union member, the grievance system has also proven to be a very valuable instrument to alert a progressive company management. This has been recognized by increasing management recognition for industrial relations personnel.

They have recognized that the
prompt, efficient and equitable solution of grievances has a tremendous impact on employee attitudes and morale and, from a very practical standpoint, helps to prevent costly slowdowns and temporary walk-outs. Grievances also alert management to many technical and human problems that might not come to their attention (at least not as soon) in any other way.

Here is where an effective grievance procedure can and does serve a company in much the same manner as an effective suggestion system. The effectiveness of both can be measured in the same manner: By the quantity of grievances and suggestions produced.

This is a perfectly logical conclusion as far as suggestion system measurement is concerned, but some may be surprised to discover that the number of grievances handled is also the measure of a grievance system. You may believe as some company executives do that a low volume of grievances is evidence of happy and contented employees.

This conclusion can hardly be accurate in the great majority of companies. On the basis of personal experience as a union steward and officer, I know that grievances are inevitable in any large industrial or business organization.

Whenever the number of grievances submitted in a company is unusually low, it could be due to the lack of confidence in the grievance system rather than to satisfaction with the company. When it happens — as it does occasionally — the company has lost the services of a valuable barometer of employee attitudes and thinking.

As stated earlier, there is probably much in common in the operation of an effective suggestion system and that of an effective grievance system, so let’s review some of the factors that we in unions have found to be important in a good grievance system.

The contract provisions must be broad enough to cover most situations, yet understood by all members. Next, adequate provisions for efficient administration must be made. Here is the key to success of any grievance procedure.

You’ve got to have people with the training and desire to make the program work. To get competent administration for the grievance system, unions sponsor special training for stewards and officers who will be called upon to handle grievances. Some of this is provided in connection with universities and other schools and some in our own seminars or workshops.

We also recognize that grievance handling requires time. In many of the union contracts in force today, provisions have been made for stewards or officers to process grievances on the job. Most company management recognize that it is in their interest as well as the employee that the grievance be settled.

Finally, of course, the real test of the grievance procedure comes in the attitude and performance of those who have been designated as administrators. In this respect, we have found that our most successful grievance people are all guided by the simple principle that “there is no such thing as an unimportant grievance.”

They believe that each grievance must receive thorough consideration and an understandable answer as promptly as possible. This, more than anything else, is what develops member confidence in a union grievance procedure.

Unions don’t have to win on all the grievances that they submit to management, but they do have to demonstrate a sincere interest and concern in the problems of every member if the system is to be successful.

This, very briefly, is a summary of what we in unions have found to be essential in developing member confidence in our grievance procedures.

Because the suggestion system is dependent on the voluntary participation of employees, I thought some of our experience in grievance procedures might be interesting and helpful to you. With this explanation we can now approach the attitude or position of organized labor regarding suggestion systems.

In answering this question, I know of no formal position that has been taken by the AFL-CIO or any of its affiliate unions on the matter. The only possible objection that any union could have to a suggestion system, in my opinion, would be if it were used by a company management in an effort to weaken the union.

Don’t believe union leadership would oppose a company program under which its members were offered the opportunity of earning additional financial rewards and personal recognition through their ingenuity and effort.

Neither can I conceive of a union leadership that would oppose a program under which its members were rewarded over and above their normal pay for making suggestions for improving and strengthening their company.

There’s nothing new about labor philosophy in what I’ve said. Many years ago, Samuel Gompers, the first president of the American Federation of Labor, expressed the same idea. He said the most important consideration for every union member was to work for an employer who could make a profit.

Actually, a union could be — and I’m sure is in many instances — of great value to a company management in developing employee participation and cooperation in programs such as the suggestion system that are of mutual value to the company and its employees.

There is certainly plenty of precedent for such cooperation in the labor-management relationship in this
country. Unions have cooperated with company managements in such things as the development of credit unions to serve employees, the development of the Vocational Educational system and in United Fund and other community campaigns in cities throughout the nation.

Unfortunately, there is still too much misunderstanding or lack of understanding in the general public—Including many management people—regarding union objectives and activities. Many still look upon the union-management relationship as an inevitable "cat and dog" affair even though this is almost completely contrary to the facts.

Some of this attitude and belief is undoubtedly due to the inadequate and frequently inaccurate picture of labor-management relationship that is present in our general news media. The press generally has exaggerated the differences between labor and management and all but ignored the much more significant story of labor-management cooperation. As a result, a number of myths about labor have continued to persist in much of the public mind.

Recently when I was invited by the Milwaukee Journal to submit an article for their "My Opinion" section, I attempted to answer some of these myths that continue to confuse the public as to the nature of the labor-management relationship in this country.

While there is little enough space to cover all of the "myths" that I tried to answer in that article, I would like to cite one of them for illustrative purposes. In response to the widely held public belief that labor unions have been the cause of much industrial strife in this nation, I pointed out that just the opposite has been true.

I cited statistics of the U. S. Labor Department showing that 98 percent of the 150,000 labor-management agreements in the nation ran their course during the 1960s without a strike or work stoppage of any kind.

I also pointed out that man-hours lost due to strikes during that period amounted to less than a quarter of one percent of the total worked. By contrast, ten times as much work-time was lost due to industrial accidents and illness.

On the basis of these facts, I concluded that the real significance of unions and collective bargaining was actually the high degree of peaceful and orderly progress that they have made possible in American industry.

Inaccurate assumptions are potentially harmful not only to unions but to the general public—including the companies whose employees unions represent. I say this because unions have much more to contribute in this period of accelerated economic and social change, but that contribution depends upon understanding and cooperation.

One of the greatest needs of every company is, of course, to communicate effectively with its employees. This responsibility has become more urgent and more complex in this era of rapid change and increasingly larger companies. The suggestion system is one instrument that management has developed to meet this challenge, and I think that it can help a great deal.

However, I would like to submit to you that the union is and always will be the best instrument available to management for communicating with employees who are union members. This has been acknowledged by numerous employee relations authorities.

This is true because the union is the member's own organization. It expresses their thinking and speaks their language or it doesn't stay in business very long.

Speaking of language, we in unions can't afford to make the mistake that an expert with the U. S. Bureau of Standards did when he answered a letter from a plumber in New York.

"Tony" had written the Bureau that he had found hydrochloric acid effective in cleaning drains. The Bureau expert responded with a letter that stated:

"The efficacy of hydrochloric acid is indisputable, but chlorine residue is incompatible with metallic permanence."

On reading the letter, "Tony" wrote another thanking the Bureau for agreeing with him. At that stage, a more practical member of the Bureau staff wrote "Tony" a letter stating:

"Don't use hydrochloric acid; it eats hell out of the pipes."

Language, of course, isn't our major problem in dealing with employers. The main roadblock is ideological. There are still managements that don't understand the objectives, functions or potential of their unions. They prefer to believe the moth-eaten myth that their labor union is some kind of alien organization in which their employees are being dominated and misled by opportunistic "labor bosses."

Those who subscribe to this thinking are depriving themselves and their companies of a tremendously valuable ally—one that shares their interest and concern for the welfare and future of the company. As I've already noted, unions can and have helped managements in the past in many areas of mutual concern when they have been given the chance.

This is going to be even more important to all companies in the fast-changing and increasingly competitive years ahead.

For this reason, I'd like to conclude my remarks by tossing out a suggestion that I believe can be of great value to you and the companies you represent. And you won't have to give any prize money for it. Consider it a gift from the Wisconsin State AFL-CIO.

My suggestion: If you haven't already done so, ask your union for its help in putting your company suggestion system over with its members. [46]
QUALITY - WHOSE RESPONSIBILITY?

BY FELIX A. LALLY

FELIX A. LALLY received his B.S. in Physics from Rutgers University then moved to the University of Michigan on a teaching fellowship for his M.S. degree. From 1956-58 he worked on electronic instrumentation design and development while attached to the Army’s Scientific and Professional Engineering Corps. He assumed duties of project leader in research and development group in the Boeing Company’s Quality Assurance Department, responsible for electric power subsystems and microelectronic studies. Employed by Electronic Products Division, Hughes Aircraft Company, as Manager, Quality Assurance Engineering. Presently Lally is with the Xerox Corporation as Manager, Quality Assurance — Manufacturing Operations. He is a member of IEEE, AMA, and ASQC and has presented numerous papers for these organizations.

Contrary to general consensus in industry today, the need for quality awareness, motivation, and cost control is more demanding in commercial, non-government oriented industry than in any other type. Both financial and operating personnel limitations contribute to the establishment of controls and programs suited to encompass a variety of tasks in a most concise and economical manner.

Included herein is a program established and instituted at Xerox with the overall intent of accomplishing the objective of: Inciting an aura of quality awareness throughout all operating phases of the working environment; providing the needed motivating element on a continued basis; and defining quality operating costs and their importance as a “control tool.”

THE INSPECTION DEPARTMENT
A. Quality Defined
B. Functions
1. Remedial Inspection
2. Preventive Inspection
3. Operative Inspection
4. Feedback
C. Responsibilities
1. Establishment of Standards
2. Areas of Coverage
3. Types of Inspection
D. Control
1. Factors Influencing Inspection
2. Inspection “Tools” (Control Charts, Inspection Check Sheets, Performance Reports, etc.)
THE ROLE OF THE PRODUCTION SUPERVISOR

A. Responsibility Defined
   1. Producing, Measuring, Maintaining Quality Standards
   2. Pride in Workmanship
   3. Quality Conscientiousness

B. Quality Maintenance
   1. Materials Used, Accuracy of Equipment, Performance of Worker
   2. The Control Thereof: Causes and Effect
      a. Knowledge
      b. Ability
      c. Care
      d. Defective Equipment/Materials

C. Creation of Conditions Conducive to Quality Attainment and Maintenance
   1. Instruction
   2. Incentive Reward
   3. Other "Tools"

D. Responsibility For Promoting Cooperation With the Inspection Department

THE COST ANALYSIS PROGRAM

Basically, the cost of quality can be divided into two parts: (1) Those costs which we deliberately incur in our attempt to produce the desired quality level; and (2) those costs which we incur as a result of not having produced perfect or desired quality. It is reasonable then to expect that as we increase the first class of costs (and approach perfect quality), the second class of costs will decrease. Or, conversely, reduction of effort to create quality will result in increased failure and defect costs.

The deliberately incurred costs are generally of two types: (1) The costs of creating the quality; and (2) the costs of trying to find out that quality we actually have achieved. The first category includes such activities as: Quality engineering; planning, formulating, and issuing test and inspection procedures; training and education of production/inspection employees; and many other kinds of activities which are designed to assure that the product is correctly made the first time.

The second category of costs are incurred to give us a measure of what quality we have achieved and to enable us to determine what action we should take. Such costs include: Receiving acceptance programs; maintenance; calibration, and control of inspection equipment; quality audits; inspections by production employees; final inspections before shipment; and in-process quality activities.

It is obvious that the dividing lines between these two types of costs are not absolutely clear. Arbitrary decisions need to be made, but it is not a major problem as long as the basic idea is maintained and the primary purpose of the activity is used for making the classification.

Since all of these costs are determined by budget allocations, they are all directly controllable by management. Therefore, these two classes of costs can be referred to as "Controllable Costs." They can be increased or decreased by order or direction of management. The quality control manager has the responsibility of deciding how his budget is to be allocated among these activities. He needs some quantitative measures of the relative benefit of a dollar spent in each of the various activities in order to make the best possible use of the funds available.

The measures of the benefits lie in the costs resulting from not having perfect products. If information is available by which we can associate resultant costs with specific activities which would have prevented that defect cost, one is in a position to determine how much he can afford to spend for that activity. Thus, another category of costs must be determined separately. These costs are divided into Internal and External Failure Costs.

Internal Failure Costs include such items as:
- Scrap
- Rework
- Sorting of Rejected Lots (100% Inspection)
- Materials Review Board Activities
- Reduction of Yield
- Downtime on Production Facilities

External Failure Costs include such items as:
- Field Complaints/Investigations
- Product Return and Repair
- Replacements

As a means of acquainting these cost classes to existing working programs, the writer has related the above mentioned cost types with those so established by Fegenbaum at General Electric:
   Class 1 — Prevention Costs
   Class 2 — Appraisal Costs
   Class 3 — Failure Costs

DEFINITIONS OF OPERATING QUALITY-COST ITEMS

A. Cost of Prevention
   1. Quality Planning (Quality-Control-Engineering Work) — Quality planning represents costs associated with the time that personnel in the quality-control function spend in planning the quality system and in translating product design and customer quality requirements into specific manufacturing controls on quality of materials, processes, and products through formal methods, procedures, and instructions.

   2. Process Control (Process-Control-Engineering Work) — Process control represents costs associated with the time that personnel in the quality-control function spend studying and analyzing manufacturing processes, for the purpose of establishing a means of control as well as improving existing process capability and in providing technical support to shop personnel for the purposes of effectively applying or implementing quality plans and initiating and maintaining control over manufacturing operating processes.

   Note: Quality planning and process control may be performed by the same quality-control engineers. The first activity may be thought of as preproduction planning and the second as providing technical support during production. Process control is aimed at controlling process-quality problems. This should be distinguished from test and inspection, defined under B, "Cost of Appraisal."

   3. Quality Planning by Functions Other Than Quality Control — Quality planning by functions other than Quality Control represents costs associated with the time spent in quality-planning work, such as: Reliability studies; preproduction quality analysis; writing instructions or operating procedures for test, inspection, and process control by personnel who do not work for the Quality Control Manager.

   4. Design and Development of Quality Information Equipment — Design and development of quality information equipment represents
costs associated with the time that personnel spend in designing quality-assurance measurement and control devices. This time should include the personnel in the business performing this activity regardless of whom they report to. It does not include the cost of equipment or depreciation.

5. Quality Training — Quality training represents the cost of developing and operating formal quality training programs designed to train personnel in the understanding and use of quality-control techniques. It does not include training costs of instructing operators to achieve normal quantity proficiency.

6. Other Prevention Expenses
Other prevention expenses represent all other expenses for which the Quality Control Manager has control responsibility and which are not specifically included elsewhere, such as costs of supervising and clerical personnel, secretaries, traveling, etc.

B. Cost of Appraisal
1. Test and Inspection of Materials (Receiving Inspection) — Test and inspection of materials represent the cost associated with the time that inspection and testing personnel spend on evaluating the quality of materials passed through the receiving inspection areas. Also, this may include the cost of inspectors traveling to vendors’ plants to evaluate purchased materials.

2. Laboratory Testing — Laboratory testing represents the cost of all tests provided by a laboratory or testing unit to evaluate the quality of materials.

3. Laboratory or Other Measurement Services — Laboratory or other measurement services represent the cost of laboratory measurement services, such as instrument calibration and repair and process monitoring.

4. Inspection — Inspection represents the costs associated with the time that inspection personnel spend evaluating the quality of the product in the shop. It does not include the cost of inspection of materials included in B. 1., inspection equipment, utilities, tools, or materials.

5. Testing — Testing represents the costs associated with the time that testing personnel spend evaluating the technical performance of the product in the shop. It does not include the cost of testing materials included in B.

6. Checking Labor — Checking labor represents the costs associated with the time that shop operators spend on checking quality of own work as required by the quality plan, checking product or process for quality conformance at planned points in manufacturing, sorting lots which are rejected for not meeting quality requirements, and other in-process evaluations of product quality.

7. Set-up Test or Inspection (Convergence Audits) — Set-up test or inspection represents the costs associated with the time that personnel spend in setting up and auditing product and associated equipment to permit procedural and physical verification as required.

8. Test and Inspection Material — Test and inspection material represents the cost of equipment, tools, and materials used for the purpose of performing inspections and tests in all quality areas of responsibility.

9. Quality Audits — Quality audits represent the costs associated with the time that personnel spend performing quality audits on the in-process or finished product.

10. Maintenance and Calibration of Test and Inspection Equipment — Maintenance and calibration of test and inspection equipment represent the costs associated with the time spent by inspection personnel in calibrating and maintaining checking, test, and inspection equipment.

11. Special Testing — Special testing represents the cost incurred by the department in special testing the product prior to final release.

C. Cost of Internal Failure
1. Scrap — For the purpose of obtaining operating quality costs, scrap represents the losses incurred in the course of obtaining the required level of quality. It should not include materials scrapped for other reasons, such as obsolescence, retrofits, and product design changes resulting from further evaluation of customer needs. Scrap might be further subdivided, e.g., between fault of own manufacture and fault of vendor.

2. Rework — For the purpose of obtaining operating quality costs, rework represents the extra payments made to operators in the course of obtaining the required level of quality. It should not include extra payments to operators for any other reasons, such as rework caused by product design changes resulting from further evaluation of customer needs. Rework might be further subdivided, e.g., between fault of own manufacture and fault of vendor.

3. Material-Procurement Costs — Material-procurement costs represent those additional costs incurred by the material-procurement personnel in handling both rejects and complaints on purchased materials. Such costs may include getting disposition from vendors for rejected materials, making certain that vendors understand quality requirements for either rejects or complaints, etc.

D. Cost of External Failure
1. Complaints — Complaints represent all expenditures for the dispositioning and handling of customer complaints.

2. Product Service — Product service represents any product service expense directly attributable to correcting problems or special testing, not included in complaints. It includes preventative measurement factors, product orientations, traveling, etc.

SUMMARY:
In times of economic stress when management must look around for places to cut manufacturing costs, it is inevitable that their collective eyes come to rest on the Quality organization — and with just cause. This essentially is an organization which has no direct profit responsibility; produces no hardware to sell, and cannot state with any degree of certainty the impact of contemplated changes on profits.

It is with this in mind that the above program was so established in providing a “control tool” for quality management in maintaining the balance and proportion needed in both the Quality and Production organizations to get the job done.

Quality management can now forecast changes in any area of the total Quality picture, and take appropriate action to reduce the undesired effect of Quality decadence, personnel complacency, and abnormal changes in prevention or detection costs.
Everywhere we look, we see space given to the subject of the need for increased productivity. Most seem to realize that productivity increases that offset pay increases are anti-inflationary and most seem to realize that increased productivity means increased profits. A few of us reject profits, and yet with all the attention focused on this subject, there is a very low degree of activity in actually increasing productivity through participative management.

Several years ago, automation was seen as the cure to all of our troubles regarding productivity and to the point that there was grave concern that automation would eliminate the need for all but the highly skilled. It would appear that automation has not been the sole answer to our problems. We have seen times greater than it was in 1952. As far as the threat to the security of management, it is no substitute for poor management. If anything, it needs better management.

Participative management, like aspirin, is not good for everyone and there should be serious soul-searching before we leap.

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