Opportunities For Productivity Improvement

ONE DAY
RETEC

Tuesday, March 26, 1985

RAMADA INN AIRPORT
MILWAUKEE, WISCONSIN

Sponsored by
Milwaukee Section of
Society of Plastics Engineers

1985 MILWAUKEE SPE RETEC

OPPORTUNITIES FOR PRODUCTIVITY IMPROVEMENT

March 26, 1985

8:00-8:45	REGISTRATION
8:45-9:00	WELCOME - Kenneth M. Simatic, General Chairman
	Morning Moderator - Robert R. Maccani, Allen-Bradley Co.
9:00-9:30	Statistical Process Control (SPC) for Quality & Productivity *
9:30-10:00	Artificial Intelligence in Plastic Processing * Paul Menig, Eaton Corporation
10:00-10:30	A Systems Approach to Shop Floor Control Terry Sheehan, Plantstar Inc.
10:30-11:00	Productivity Improvement Through Motivation and Communications Ted Hutton, Allen-Bradley
11:00-11:30	Injection Molded Printed Wire Boards * Dr. John Ganjei , ICI Americas
11:30-12:00	Liquid Injection Molding (LIM), An Alternative to Silicone Gum Rubber * Gene Kyburz, K-Sil, Inc.
12:00-1:30	LUNCH SPEAKER - Dr. Thomas W. Haas, SPE
	Afternoon Moderator - Alan K. Murphy, Eaton Corp.
1:30-2:00	Productivity Improvements Through Prototyping Glenn Beall, Glenn Beall Engineering
2:00-2:30	Conductive Thermoset Compounds Larry Rupprecht, Fiberite
2:30-3:00	Conductive Thermoplastic Compounds Bill Wright, RTP Corporation
3:00-3:30	Wear Resistant Thermoset Polyesters * George Sundstrom, Premix Inc.
3:30-4:00	Silicone IPN Materials John Gavin, Petrarch Systems Inc.
4:00-4:30	Introducing Xydar Marvin Fein, Dartco Manufacturing

* - Paper will be distributed at the meeting.

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A SYSTEMS APPROACH TO SHOP FLOOR CONTROL

By

Terry Sheehan

PlantStar, Inc.
Schaumburg, IL

Manufacturing a high quality product consistently at a lower cost and with greater efficiency demands timely, accurate production information. The last decade has seen a dramatic increase in the use of computers at all levels of the manufacturing process. From programmable controllers, to robotics, to data processing and information management systems, the manufacturing operation is being viewed and controlled from a totally new perspective. Efficiency, improved quality, greater productivity and better working conditions are only a few of the benefits that these changes have brought to the factory environment.

However, the most critical production data has not been supplied by most computer information systems. Data collected and available on a real-time basis. But now, Computer Aided Factory Monitoring (CAFM), the ability to monitor the factory production process in real-time, is available. Manufacturers can access the data necessary to produce a quality production ... consistently. To substantially reduce rejects and decrease downtime. To track all the variables that affect machine operation. And to view actual machine performance. Real-time monitoring can provide a clear picture of your manufacturing operation and a better understanding of how your product is produced.

Producing a high quality product requires strict control of the manufacturing process. Real-Time Monitoring Systems provide the ability to calculate and manipulate data which is automatically collected from the machines and controls on the factory floor. They can be successfully implemented in manufacturing environments which are fully automated, in the process of automating or in new operations. These systems can be applied to any single-step or multiple process operation where the primary concern is to produce a high quality product with the lowest possible rejects.

Product consistency demands control ... over the entire realm of resources working in the factory environment. And the most efficient way to maintain control is through the collection and analysis of real-time data.

CAFM supports a broad range of machine monitors, from the simplest form of a standard, single shift, single sensor monitor to a stand-alone microprocesor-based monitor capable of tracking all activities on multiple shifts. These devices actually encourage the factory operator to become more involved with the production process. A digital display enables the operator to compare actual performance values against standard values. Color coded status lights of green, red, yellow and blue (the same coding applies to the CRT display) signal whether the machine is running at standard rate, too slow, too fast or is down. Two simple dial controls even allow the operator to input downtime by reason, or two call for assistance without leaving his machine.

Data collection is possible from relay, solid state and programmable controlled machines regardless of their manufacturer. Moreover, auxiliary sensor devices associated with a machine or workcenter (i.e. vision devices, bar code, etc.) are also data sources for the system. And because this information can be accessed on an immediate basis, it is easy to avoid production snags while making optimal use of all plant personnel.

The following list represents only a portion of the information that can be tracked regarding machine status and performance:

Actual Cycle
Gross Production
Net Production
Rejects
Completion Time
Downtime by Reason

In addition, the CAFM is capable of tracking and reporting a wide range of process variable types. The choice of variables may be configured by the user, including:

Temperatures
Pressures
Speeds
Positions
Gauging

The CRT displays represent one of the most important features, forming that indispensable link between the factory floor and management. Color coded CRT displays alert the user to problems with instant, accurate information. Plant Managers, Production Foremen, and Process Engineers, alike, can now make informed, intelligent decisions regarding machine, personnel, and shift performance.

Menu driven displays and a comprehensive on-line HELP facility make the CAFM easy to operate, even for the first time user. Color graphics capabilities illustrate important data in an easily understood format of bar and point charts. Plus, built-in templates make it possible to create your own displays, thus offering all the information you need to take decisive action during the actual production cycle.

The following are just a few of the displays available at any time.

Plant Status
Exception Status
Quality Status
Machine Status
Machine Diagnostics
Downtime Analysis
Process Parameters
Set Point
Statistical Process Control

Timely, accurate reports provide the information tools necessary to gain insight into the measurable variations that occur throughout your production process.

Summaries can be generated for machine and job performance, production, downtime, assistance, rejects and more. You can even produce detailed histograms, Pareto Charts and Scatter Diagrams. Also provided is the capability for automated Statistical Process Control charts to give you precise control over the quality and productivity of each and every work center variable. Job data, such as production summaries and downtime can be accessed via printed reports or displayed on the video screen.

All data collected at the machine monitors on the factory floor is transmitted to the advanced microprocessor-based Front End Unit(s) for real-time processing. It is from here that displays and reports are generated. For central data storage, and long term reporting capabilities, the CAFM uses a multiprocessor Central Unit typically linked with one or more Front End Units by a Local Area Network (LAN) link. This Central Unit hosts the XENIX operating system which supports a Relational Database software kernal. The latter ensures significant flexibility in handling data correlations and expansions. Such a distributed database minimizes the occurrence of single points of failure in the overall system.

Whether semi or fully automated, today's manufacturing operation depends upon a wide range of computer power. The CAFM is particularly versatile in its ability to communicate with virtually any other computer system. Communication is possible through a direct serial link, and attachments to an Ethernet or GM-MAP (GM's Manufacturing Applications Protocol program) Broadband network.

As each area of the manufacturing operation turns to automation from the machines on the factory floor, to the operator and job tracking level, to the communications network level - the CAFM Series can be integrated with new systems while it continues to provide full monitoring capabilities.

From the factory floor to the top of the corporate pyramid, the CAFM provides the data necessary to influence and improve the total manufacturing process.

Plant Manager

Production Summaries and Exception Reports are available at a moment's notice, keeping the Plant Manager up-to-date regarding all activities taking place on the factory floor. Problem areas are highlighted so that immediate action can be taken.

Production Foreman

With the help of machine and operator performance evaluations included in the production summary, the Production Foreman can allocate his time where it is needed most. By monitoring job status, from the number of pieces to be produced by their projected finish time, the correct amount of materials needed and when they will be required can be forecast and ready for the next production cycle.

Machine Operator

Machine monitors serve an indispensable role; providing all data pertinent to the production cycle in a simple, logical manner. Operator input provides an in-depth account of all machine activity from downtime to assistance requests.

Process/Quality Engineer

Process variable monitoring is the secret to the manufacturer of a consistently high quality part. And with the FOCUS UX Series, the Process Engineer has immediate access to the specific information needed to maintain his high quailty standards. For example, data recorded from previous runs of the same product may be used to establish the correct setpoints - thus saving time and money when changing jobs or when controlling the present job.

Maintenance

Machine performance is greatly enhanced due to the ability of the FOCUS UX Series to monitor machines on an individual basis. Production/Machine Monitoring means that maintenance will know, in advance, when a machine will require routine maintenance or when the current job is scheduled to change.

By continuing to bring high technology to the factory floor, PlantStar/Intermetrics is helping American Industry move toward Computer-Aided Factory Monitoring in the factory. Our experience, commitment, and equipment are represented by PlantStar people working together to create and implement. Computer-Aided Factory Monitoring systems for today and tomorrow.

Our goal is to provide innovative new tools - the technology and the products - industry must have to achieve unprecedented levels of productivity, quality and employee satisfaction.

PRODUCTIVITY IMPROVEMENT THROUGH MOTIVATION AND COMMUNICATIONS

By

Ted A. Hutton

Allen-Bradley Company
Milwaukee, WI

PRESENTATION TO THE PLASTICS ENGINEERING REGIONAL TECHNICAL CONFERENCE

March 26, 1985 -- Milwaukee, Wisconsin
Ted A. Hutton - Director Human Resources
Industrial Control Division - Allen-Bradley Company
Milwaukee, Wisconsin

SUMMARY:

Opportunities abound at all levels in the organization to improve the productivity of our human resources. The key for the management of an organization is to successfully "implement" the basic principles of motivation and effective communications to encourage and enable improvements in productivity to take place on an ongoing basis. The purpose of this presentation is to outline in practical terms some techniques for improving employee motivation through effective communications. The strategy for management in the 1980's and 1990's will be cost effective employee involvement and participation. Maximizing the productivity of our human resources is a basic management talent and one that is important to the survival of American business and industry for the decades.

PRODUCTIVITY IMPROVEMENT THROUGH MOTIVATION AND COMMUNICATIONS

There are three fundamental parts to this presentation. All three are important to the total understanding of management's role in effective leadership of an organization. The three key areas are as follows:

1. Productivity Improvement.
2. Motivation.
3. Communications.

During the course of this presentation we will attempt to identify the key elements of each of these three areas and build upon them so that we understand both the theory and the practical application of these to the day-to-day world of work.

PRODUCTIVITY IMPROVEMENT:

First of all let's look at productivity improvement. In the past decade much has been written about the area of productivity improvement in the United States and throughout the world. We have all seen the articles, TV shows, the news broadcasts, the trade magazines, the seminars and countless other sources where the productivity challenge has been explained. When you sort all of this information out, it leads one to conclude that management must want to return to the basics. The basics are effective application of the management principles of planning, organizing, leading, coordinating and controlling. There are no gimmicks, there are no quick fixes that have long lasting value. What does have long lasting value is a practical effective application of these management principles. Those organizations that "pay attention to the details" and train their managers from the top to the bottom to be effective, will, in fact, consistently achieve productivity improvements on an annual basis.

After addressing the issues of basic management principles as the long term strategy for productivity improvement, one needs to fully understand what the results are from productivity improvement. There are numerous results, including output of goods and services. All of the inputs (labor, capital, material, and energy) need to be considered if we are to be effective in our measurement and analysis of productivity improvement.

Another measure is certainly that of quality. American business is re-learning the lesson of the past that quality improvement means improved productivity. We are putting meaning back into the words "make it right the first time."

A third area deals with the issue of service. How productively can we deliver the service to the customer.

And then there are financial measurements of productivity improvement, including profitability without price increases, and return on assets which takes into consideration the capital aspect of an organization.

What we have learned over the last decade is that productivity improvement is not a single dimensional issue. It is a multi-dimensional issue.

MOTIVATION:

Motivation of individuals or a group is involved in every aspect of the management process. If we define management as "getting results through others," then we quickly understand the importance of a motivated work group to achieve those results. The root word from which motivation is derived is the word "motive," which simply translated means provide a reason or to explain why certain things should be done. Effectively explaining the why, or giving people a sense of purpose, direction and meaning to their jobs brings about the natural and much sought after aspect of employee involvement and participation. In the past five years, many techniques have been explored in the area of employee participation and employee involvement. Whether they are called quality of work life programs, employee involvement programs, quality circles, participative management, or whatever, the fundamental objective is to find an effective way to manage people by letting them manage themselves to a greater degree.

Mary Kay Ash, in her recent book about managing people, talks about the phrase that we ought to see people as if they had a sign around their neck, and the sign says "make me feel important." You will be receiving a little pink card with this message contained on it. I have used this for the last 15 years as a hand-out to our own supervisors and to people around the country. The phrase is originally attributed to Will Rogers, who certainly understood human nature and the basic motivation principles. We only need to think about how this applies to us personally, in our relationship with others, to understand how it could and should work with people throughout the organization.

COMMUNICATIONS:

This leads us into the third area of communications. It should be easy to understand that a key part of the management job is communications. In fact, primarily management is the process of communications. Whether its communicating a plan, coordinating an activity, explaining an organization structure, setting a goal, explaining a control feature, such as performance appraisal, absenteeism control or return on investment -- management involves communication.

In a presentation such as this, it is one thing to talk in general terms about productivity improvement, about motivation or about communications; but the real heart of the matter for a conference is to learn some practical techniques that you can modify and then apply in your own organization. My challenge, as one of your presenters, is to offer some constructive practical suggestions that have application to all types of organizations. With this in mind, I would like to explain to you an approach to communications that we think meets all of the criteria of aiding in the productivity improvement process and providing the motivation or the why people need to be involved in their jobs.

In May of 1982, the Industrial Control Division of Allen-Bradley Company launched a five year communications strategy which we entitled "Communicating for Productivity & Survival." During the past three years we have dealt in depth with the following subject matters:

1. Domestic Competition.
2. Foreign Competition.
3. Total Compensation.
4. Allen-Bradley Products.
5. Employee Ideas.
6. Safety and Productivity.
7. Stockless Production as a New Technique.
8. Quality and Productivity.

In the future, we will be dealing with subjects such as

Allen-Bradley Markets -- Where are products Used.
Management's Role in Productivity Improvement.
Education and Productivity Improvement.
Distributors and Productivity Improvement.

Let me explain some of the basic premises on which this communications strategy is developed.

1. Practicality -- We have taken the dominant research in the field of employe communications and attempted to apply it.

2. It is a strategic approach that is long term. It is at the very minimum a five year strategy and we hope that it will go on indefinitely.

3. It is business related. We are communicating about those things that have a direct effect on the business and the marketplace in which we operate.

4. The whole emphasis is on communications through the first line supervisor, and this is a key aspect of the program in helping managers be more effective because they are more effective as communicators.

5. It encourages employee involvement through the development of ideas and through the reenforcement of a participative management approach.

6. It involves employees at all levels, management, clerical, technical, hourly and salaried throughout the division.

7. We use a variety of techniques

   -- first line supervisors face-to-face communications, the primary focus
   -- bulletin board material
   -- posters
   -- small group meetings
   -- large groups meetings
   -- videos
   -- field trips by employes.

8. We try to make the information motivational, interesting and thought provoking.

9. Measuring the results is a key aspect of this program; whether its through a sample group of employees; through the measurement of employee ideas; or a direct feedback from managers, we attempt to measure the results of our communications effort.

Attached you will find some exhibits which outline some of the basic information with the CPS strategy.

The fundamental elements to understanding this CPS strategy is what we call "feeding the system" and it can best be diagrammed with the graphic #1. We think that managers and supervisors want to communicate if we will

1. Train them on how to communicate; and

2. Provide them with meaningful and interesting information to communicate on a regular basis.

The heart of the CPS strategy is to achieve those two objectives.

With this background information, I would like to share with you a brief slide presentation review of the CPS program as we have practiced it for the last three years.

As you can tell from the attached article from the January, 1985 issue of the National Safety News, we are more than willing to share this information with other organizations since we think the principles can be applied effectively in other situations.

In summary, my challenge to you is to look at your role as a communicator, and to look at your organization to see what can be done to improve communications in the interest of employee motivation, which will result in improved productivity.

The attached graphics entitled "The Manager/Supervisor as Communicator" helps us review our own personal approach to this important management function of communications. Each of us needs to review where we are and where we want to be. As explained in the presentation, communication involves not only the issue of what to communicate but it also involves the critical issue of who should communicate it. We are convinced that the manager and the first-line supervisor are the key communicators in the organization. We think the companies throughout the United States and the world are rethinking this lesson and trying to effectively apply it.

It has been the purpose of this presentation to explain to you the practical approach to communicating information that will assist you in managing more effectively. If you are motivated, then there is a good chance that you will be able to provide a climate for the motivation of others. It is important that we not lose sight of he fact that communication, the sharing of ideas, is an integral part of our success.

I trust that this presentation along with others will aid you who are part of the plastics profession, to make a significant and lasting contribution to the productivity improvement of your organization and of our nation as we work together to become world-class competitors in the decades ahead.