

# PRODUCTIVITY

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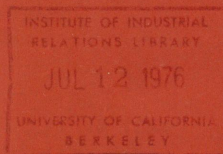
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## IMPROVING PRODUCTIVITY

A Description  
of Selected Company  
Programs //



**DECEMBER 1975**

U.S. National Center for Productivity  
and Quality of Working Life .

**IMPROVING PRODUCTIVITY**  
**A Description of Selected Company Programs**  
**(Series I)**

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## Preface

It is generally accepted that productivity increase is crucial for both product improvement and cost reduction. However, companies are often uncertain about how to proceed in developing programs to improve productivity that will have strong management support, good labor cooperation, and well-defined objectives.

This report was undertaken by the Commission as part of its responsibility to identify and disseminate information about methods for utilizing technological and human resources to improve productivity. It describes programs that are currently operating in 5 companies in different industries throughout the country. The studies focus on how the productivity improvement efforts were organized, what was done, how it was done, and what was accomplished.

The studies were chosen for their diversity. They cover companies both in services and manufacturing. They provide a variety of approaches to a productivity improvement program based on the specific needs and goals of the individual companies.

Their inclusion in no way implies an endorsement. What the studies illustrate is that many adaptations are necessary and possible in designing a productivity improvement program for a specific company. It would be unwise to follow one company's approach without considering their special circumstances.

The Commission wishes to acknowledge the cooperation and assistance of Beech Aircraft Corporation, The Detroit Edison Company, Honeywell, Inc., Thiem Corporation, and United States Steel Corporation in providing information.

The report was prepared by Thornton Moore and A.N. Wecksler, consultants to the Commission. Mr. Moore, an industrial economist, was previously with the U.S. Department of Commerce in an executive position. Mr. Wecksler is Washington Bureau Chief of the Cahners Publications, and was consultant to several Presidential Committees. Leon N. Skan, Regional Representative of the Commission assisted in the studies. The project was directed by Edgar Weinberg, Assistant to the Executive Director of the Commission.

# Highlights and Conclusions

The programs of the five companies differ in their organization and content, but they all have the same goal of improving productivity — that is, productivity in its broadest sense which involves more effective utilization of materials, energy, supplies, human resources and technology. All of the programs make use of similar methods to accomplish this.

Objectives of the companies in establishing, or intensifying their productivity improvement programs varied depending upon their needs and concerns. The major objectives were to:

- Strengthen competitive position in the domestic and foreign markets.
- Achieve greater flexibility for responding to changing economic conditions.
- Counteract increased costs of materials, energy, supplies and labor.
- Meet the pressure of rising costs and rate regulation.
- Obtain funds needed for capital investment for modernization and expansion.
- Maintain wages at fair levels.
- Conserve materials and energy.

Each company employs a combination of policies, plans, and methods which are designed to meet its own specific situation and needs. These actions are directed toward (1) better utilization of employee skills, (2) involvement of employees in problem solving, (3) stimulating increased productivity and cost reduction, and (4) expansion of the market through new and improved products.

Two of the companies make use of a productivity measurement system to help them identify areas where performance is below standard and improvement efforts are needed. None of the programs covered by this report specifically includes capital investment for new plant and equipment, which is one of the major ways to improve productivity.

In spite of the differences in the company approaches, a general pattern for establishing a productivity improvement program emerges from the studies:

- The chief executive officer has a key role in determining the need for a program and initiating it. Top management is involved in the development and adoption of productivity improvement policy and company goals.

- The step that logically follows is the formation of a top management team. It may be organized to include labor leadership, or to provide for consultation with worker representatives. Outside consultants may be called in.

- Depending on the size of the company, an organizational unit can be established to carry on a productivity program. Such a structure can take the form of a special department, or a special committee, or an expansion of responsibility of an existing committee. A special coordinator can be named from industrial engineering, accounting, or top management staff, or the program can be carried on through existing line management alone.

- Educating middle management and supervisors in productivity improvement is crucial. As key people in implementing the program they will need training sessions covering the concept of productivity, how to measure it, and the tools and techniques for improving it.

- Personnel at all levels need to be involved through meetings at the plant, departmental or office level. Work group meetings can be organized, informal discussions can be arranged, joint labor-management committees can be established. Continuing communications through bulletins, workshops, films, and posters are essential.

- The program should provide for periodic review and evaluation of results. This requires establishment of measures and goals. Immediate visible goals can be set, such as increasing quality, reducing scrap, saving energy, increasing turnover, increasing safety, reducing tardiness - turnover - absenteeism - rework.

- If productivity is to be measured for each of the company's organizational units, measures and goals have to be established for them and periodic reports provided to identify units with below-standard performance. This task will require direction and technical assistance from the company coordinator of the program or an outside consultant. It has been found that a measuring system brings some improvement in performance by making people more aware of the meaning of productivity.

- Part of the total company effort is to raise the awareness level within the organization of all the factors that will increase productivity,

and of the system for improving productivity.

A number of characteristics that are requisites of a workable program stand out:

- Company support for the effort at top management levels.
- Recognition of the key role of the company's employees.
- A full understanding at all levels of the purposes and objectives of the productivity improvement program.
- Establishment of goals and the development of valid measurements to reveal whether, and to what extent, the goals are being met.

- Improvement in productivity should be obtained to the extent possible without impairing job security.

The studies indicate that the programs established by the five companies are operating successfully and are stimulating improvement in productivity. However, it is apparent that there is no such thing as "instant success" for a program. A company may find it necessary to modify its program after a trial period. And above all, time is required, the larger the company the longer the time to develop a program, put it into operation and begin to obtain results.

## AIRCRAFT COMPANY USES VARIETY OF PROGRAMS

### Beech Aircraft Corporation

### Wichita, Kansas

*Beechcraft's productivity improvement programs are designed specifically to promote a cost-conscious attitude toward all company operations through the exchange of ideas, coupled with motivation, encouragement and individual recognition of all personnel. The company employs a variety of programs to increase output and reduce costs, ranging from well organized work simplification, materials conservation, value engineering, and better utilization of commonality in design, planning and production to a continual program of communications and incentives. Cost savings attributable to the productivity improvement effort are substantial.*

Beech Aircraft specializes in the design and manufacture of private commercial planes for business and personal use. The company is also a military contractor, and in 1974 its defense/aerospace volume accounted for 9% of the total sales volume of more than \$200 million. It operates six plants, five in Kansas and one in Colorado, and has 7,600 employees.

Fiscal 1974 commercial sales recorded an all-time company record, with the company's aircraft reaching markets throughout the world.

The company produces a wide range of private aircraft models, from single engine models to a variety of heavier business/corporate twin engine aircraft.

Accelerated research and development programs are underway in the company in areas of both basic and applied research. In addition there are a number of commercial programs to expand the market for the company's products.

### Productivity Improvement Efforts Initiated in 1964

Beech Aircraft Corporation formalized a number of productivity improvement techniques in 1964, responding to the appeal of the late President Lyndon B. Johnson, who at that time called on all defense contractors to establish an affirmative program of cost reduction in the performance of defense contracts.

The effort was not new to the company. A cost reduction program had been pursued in the company since 1953. The Presidential urging, particularly as it was accompanied by a statement that the Secretary of Defense would take any cost reduction achieved into account in

making future source selections, and in determining profit and fee rates on non-competitive negotiated contracts, was, however, a significant factor in intensifying the productivity improvement effort.

The concentrated effort was initiated at the highest echelon of company management, and a briefing session was held in 1964 for more than 650 Beechcraft supervisors, crew chiefs, lead men and foremen on the accelerated cost reduction and cost consciousness programs at Beech.

More than 15 formalized cost reduction programs were initiated in the course of the company's effort including budget control, methods engineering, employee suggestions, producibility engineering and work simplification.

### Beechcraft Opportunity for Improvement Program

The effort at productivity improvement has continued with each of the various programs functioning under an all-embracing "Beechcraft Opportunity for Improvement Program."

The overall improvement program is under the direction of the Controller-Cost Management of the Corporation. An annual budget is established for each program which must be justified by relating the cost to administer the program to the savings or other results accomplished.

Each individual program has its own administrator, responsible for administering and promoting his program. The development of the individual programs was largely a process of evaluation.

The Administrator of Work Simplification, who heads an active area of effort at productivity improvement, reports that in a recent year, work simplification produced a savings of more than a half million dollars. This was practically double the savings recorded for simplification efforts in 1965.

In that same year, fiscal 1972, the savings achieved through the various productivity improvement programs were reported as almost \$300,000 in the manufacturing engineering division; \$1,600,000 through materials conservation and usage; \$130,000 in production control; \$31,000 in tool improvement; and \$580,000 in value engineering.

The total reported savings through formal productivity programs for fiscal 1972 were \$3,155,000. This total compares with reported savings in fiscal 1965 of \$1,824,000.

These trends point up the experience in Beech that programs grow slowly.

## Work Simplification Program

The Administrator reports the Beech Work Simplification Program has been slowly, but steadily growing. At the start, the paperwork was easily handled by one staff member and a clerk-typist working full time on the program.

When the program was first launched, it was thought that a team effort would be most effective, so work simplification teams were organized throughout the shop area.

Key personnel were chosen in each department, and they held regular meetings which were chaired, in most cases, by a crew chief or foreman. This approach did not work well at Beech, as it developed that the chairmen of the sessions dominated the meetings, and individual members lost interest.

The team effort died, but from it, experience was gained that led to the present success of the program.

A few basic rules were found to be necessary for a successful simplification program:

1. Work simplification has to be a grass roots thing. The employees have to be involved and interested.
2. All levels of supervision have to be involved, and supervisors must let their employees know that the extra effort they put forth

to improve their jobs is appreciated.

3. Each employee knows more about his job than anyone else in the organization, and he is in a better position to improve it.

4. Recognition is the catalyst that makes the program function and grow.

Currently, the Beech Simplification Program depends almost entirely on improvement proposals by individual employees. However, the company is trying out a new approach under which team effort is encouraged through competition and recognition of achievement.

While it does cost money to start and maintain a successful Work Simplification Program, Beech has found that the returns are manyfold for each dollar spent. The benefits do not end with direct dollar savings. The improvement of employee morale is marked. There is a direct improvement in attitudes as well as performance levels. The program tends to develop better communications between employees themselves and between employees and supervisors.

In outlining the Beech Work Simplification Program, its Administrator points out what he considers the key elements for organizing and operating such a program:

- Select a Work Simplification Administrator. He will be responsible for organizing, training, follow-up and direction of the program. In most plants this will be a full-time responsibility. Experience at Beech is that the majority of improvements come from shop employees. It is important that the Administrator report to top-level management. The program should be plant-wide. Everyone should have the opportunity to participate regardless of his type of work or status within the organization.
- Management Support. Management must give the program its full support. Each level must know that the level above is fully behind the effort. When Management creates the proper climate for improvement, the people will make the program a success.
- Publicize the Program and Give Recognition. Publicize the program through meetings, memoranda, company papers, bulletin boards, posters, etc. Work Simplification is not a one-shot program. It must become a way-of-life. This requires a systematic follow-up to keep the program alive through citations, posters, publications, management contact, letters home, competitive trophies, etc.



- **Training Program.** In order to bring out the latent ability of everyone in the organization to its fullest extent, some form of training must be made available to all employees. Beech experience has been that many employees who are willing to participate in the program have no idea of what to look for in analyzing their job assignment. After they have learned some of the basic tools and techniques used by industrial engineers, there is no stopping them.

- **Measuring Effectiveness.** Many improvements installed through Work Simplification are relatively simple. They represent small dollar savings on an individual basis, and probably would not be suggested by industrial engineers. However, company-wide total savings represent a substantial figure. To measure the effectiveness of the program and evaluate the techniques used, some method of measurement must be developed.

Just as is the case with all of the Beech productivity programs, there is full management support for the Simplification Program. The Chairman of the Board commissioned the designing of a large silver roving trophy, especially for the program. The trophy is presented by the President of the Company to the department making the greatest achievement toward work simplification in a year. Departments are ranked by factoring the number of improvements and their estimated value in relation to the number of employees in the department, enabling the smaller departments to compete with the larger departments on an equal basis.

## Suggestion Program

In a somewhat parallel effort, but operating under a structure and a supervision of its own, is the Beech Suggestion Program.

Suggestions of the following type are considered for awards:

- Savings in time, effort or material.
- Improvement in product or design.
- Improvement in process, method or system.
- Improvement in facilities, tools or equipment.
- Reduction of hazards to people or property.
- Reduction in paperwork.

- Other items that are beneficial to the company.

Monthly awards are made in amounts ranging from \$10 to \$50, and semi-annual awards are made from among the monthly award-winning suggestions.

The semi-annual awards range from \$50 to \$300, with the company paying all the withholding taxes on all the award money. When award checks are presented, mementos such as Beechcraft engraved quality brand lighters, pocket knives, bracelets, etc. are also presented.

All employees paid on an hourly basis are eligible to participate in the suggestion program, but suggestions which employees are expected to make as a part of their job assignments will not qualify for an award.

All suggestions are submitted to the Work Simplification Office for evaluation and implementation. The suggestions are initially reviewed by a preliminary committee, which includes at least one representative each from manufacturing, quality control, tooling, production control, manufacturing hours control, and the Suggestion Administrator.

This committee reviews submitted suggestions and makes a tentative evaluation of each suggestion. Final decisions are made by another committee consisting of the Company Vice President for Industrial Relations, the Vice President of Manufacturing, the Division Manager of Manufacturing Engineering, the Vice President of Production and the Suggestion Administrator.

The Suggestion Administrator plays a key role. The Administrator thoroughly investigates all suggestions to determine their originality, inventiveness, unquestioned ownership, accurate and realistic savings. He is also required to see that the suggestion is put into use, and becomes an accepted standard procedure.

The Administrator sees to it that the proper tooling or equipment becomes available to implement any suggestions that are accepted.

In outline form, the suggestion system is based on the concept that anyone can submit an improvement proposal. The idea is discussed with the supervisor, personal contact is made with the originator of the suggestion to discuss the proposal; proposals are investigated, evaluated and additional facts gathered as

needed. In the event that the suggestions are held impractical, the originator is informed and an explanation is made. A citation is prepared, and a copy of the proposal is filed in the employee's work record folder. The citation and award is presented to the originator by the Department Manager or the foreman. The award proposals are evaluated for further recognition and monetary awards by two management committees.

The suggestion proposals are made on forms supplied by the management. If possible, the old and new proposed methods are to be shown on before-and-after photographs.

A brief description of the old method is asked for. The new method is to be described in a concise and accurate manner.

Also required is that the suggestion outline the benefits derived from the new method in specific terms, giving labor savings in annual manhours and material savings in annual dollar amounts.

During a recent month, 39 employees received suggestion awards. Five were top awards of \$50. In addition to receiving citations, money and a chance to participate in the semi-annual awards, the awards winners are featured in the company newspaper both in photographic coverage and editorial recognition.

## **Beechcraft Employees Bonanza Plan**

The Beechcraft Employees Bonanza Plan, another effort at productivity improvement, was put into effect September 25, 1972.

Simply stated the plan is a money incentive for employees to participate in productivity improvement. Under this plan, improvement is measured in equivalent pounds of airframe manufactured ready for delivery per payroll dollar.

The degree of improvement is determined by comparing the equivalent pounds of airframe manufactured, ready for delivery, per payroll dollar paid in the period under consideration to the "par" index figure established on a similar basis. Par was based on the experience during fiscal year 1972.

Under the plan a 1.5% improvement in productivity with a base rate of \$4 per hour produces a 3-cents-per-hour Bonanza Plan payment to employees on the active payroll as of the end

of the participation period. An increase in bonus payments is made as there are further increments of productivity increase.

During the first year of the Bonanza Plan, payments totaled \$1.6 million, and in the second year the payments were \$2.2 million. For an employee who makes the average wage, the bonus payment totaled \$575.

## **Bonanza Baron Booster and Zero Defects Programs**

The Bonanza Plan has led to offshoots such as the Bonanza Baron Booster Program involving the manufacturing personnel in Beech's Plant II. The program, launched in May of 1973, is designed to raise productivity through developing friendly competition within the company's production facilities.

Under this effort, all Plant II employees are divided into teams of no less than five people. Teams consist of people who usually work together in a work area. Each team competes against all the others to achieve the largest productivity increases each month. Increases are posted weekly and monthly. Each team elects a captain who handles all communications, keeps the productivity scoreboard updated, encourages and assists his team members to make improvements.

The Bonanza Plan is credited by company officials as being the largest single booster of another productivity improvement program — Zero Defects. The Zero Defects effort was started at Beech in 1965. All the employees, including supervision, are continually reminded that people's lives all over the world depend on their craftsmanship. Craftsmanship is recognized on a regular basis in the company publication "The Beechcrafter," by picturing outstanding production crews and telling the story of how they produced a large number of units without a defect.

Early in 1967 the program was promoted by running a "Zero Defects Slogan, Thought or Rhyme" contest. The winner received a free weekend all-expense trip to Las Vegas.

Individuals are recognized on a monthly basis for outstanding achievements in Zero Defects. Those who are chosen for awards are called into their respective Manager's office, where they are presented with a Zero Defects Citation and A

Zero Defects lapel pin. In addition, these employees are given a half-hour ride in one of the airplanes they helped to build. All this is done on company time.

## Value Engineering

Value Engineering is recognized at Beech Aircraft as a significant factor in productivity improvement, with "VE" defined as a "creative approach to the achievement of required function at the lowest cost."

The "Commonality" Program is still another company effort to improve manufacturing efficiency. While the VE program is designed to stimulate engineering and design changes in both product and parts, the Commonality Group was formed to reduce the number of overall parts required to produce the complete line of the company's aircraft.

The two programs are managed in separate groups which are both directed by the chief, Commonality Program and Value Engineering, who in turn reports to the Vice President, Aircraft Engineering.

The Value Engineering Group has engineers assigned full time to the program. Their primary job is to insure that new value engineering projects are continually initiated, and to insure that when changes are approved, the final engineering required to put the innovation into production is made available.

Each VE project is evaluated by Engineering for an engineering estimate including required testing to approve the change; Tooling to estimate tooling change; Manufacturing Hours Control to estimate the manhour difference between the proposed change and the current production item; Service Publications for an estimate of handbook and service manual changes, and Procurement for any change to the cost of the bill of material.

These evaluations result in an estimate of costs, which are then consolidated to see if the proposed changes will result in a cost saving over three years of production. If the cost savings during that period are three times the costs of development, and the project engineers on the project agree to the change, then the change will be approved and will be made.

At times, and for special reasons, a saving of less than three to one will also be approved.

Roughly 25 to 30% of changes that are proposed meet the required criteria and go into production.

Proposals for VE changes come from several sources. VE works closely with Procurement on vendor items in order to find lower cost suppliers for equipment. Value Engineering or engineers in other groups may initiate projects, or shop personnel may make proposals.

As a general guide for participants in the VE Program, a Value Engineering Manual has been prepared which outlines the history, definitions and objectives of Value Engineering — stressing that VE does not cheapen the product — that more often than not, a value engineering change actually increases performance.

The Manual describes in detail the paperwork involved in a VE change, and then goes on to describe the various value engineering techniques. Finally, the publication describes the roadblocks that impede changes and makes suggestions on how to overcome these roadblocks.

## Commonality Program

The Commonality Group was established in 1970 to lower production costs by better utilization of commonality in design, planning and production, where feasible. The group is made up of engineers, tool planners, and production planners working full time on the program.

Savings from the Commonality Program come from both direct and indirect manhour savings. The indirect savings come from Engineering, Tooling, Production planning, as well as other plant effort, as a common assembly or part allows a reduction in drawings and tools, and makes the planning function easier. Just as is the case with VE, the Commonality Program is based on the concept that changes pay for themselves within three years.

To start the Commonality Program, each major assembly was broken down to specific subassemblies. These subassemblies were then studied to see what parts and assemblies could be made common between models. The study was made by visually comparing each part that made up the various assemblies for each model, discussing the assemblies with the workers on the line, as well as with crew chiefs and foremen. When the study was completed,

preliminary sketches of the proposed design were drawn up where necessary, and a list was made detailing changes necessary to individual parts that would be required to develop a common assembly.

Once this change plan was approved, man-hour estimates were made of the savings, and the engineering to accomplish the change was begun.

A number of such changes have gone through the approval process and 10 of them are already in production. Engineering is now almost completed on the entire program, and approximately 40 to 50% of the subassemblies are in production.

Commenting on the effectiveness of both the VE and Commonality effort, the chief of this program area points out:

"It is my conviction that both of these programs are proving to be successful and are important aids in helping Beech hold down increases in cost."

## Materials Conservation

Conservation of materials makes a substantial contribution to the total savings effected through productivity improvement at Beech.

This activity is the responsibility of the Supplies Control and Conservation Department which has a staff consisting of a chief, one supervisor and six technicians all with manufacturing backgrounds. As their function is described they have "Carte Blanche" to go into any part of the company plants and to ferret out any wasteful practices, or to develop better ways of processing or handling materials.

The staff is experienced, all senior men, with an average seniority of 15 years with the company. They are specialized, including a specialist on metals and another described as "the best plastics man in the company."

Much of the success of the conservation program is attributed to the excellent working relationships with all divisions of the company. While there are the normal and routine conservation tasks of salvaging mixed hardware, fittings from tubing, etc., primary emphasis is on preventative conservation.

Conservation personnel join with manufacturing in reviewing all Material Review scrap decisions to be sure satisfactory rework is not possible and to determine causes to prevent repetition. Conservation reviews all scrap responsibilities and generates follow-up for corrective action.

Practically all steps taken to protect parts between fabrication areas and the end product are initiated by Conservation. Conservation develops special transportation fixtures, handling containers, etc. to see that parts stay in the best possible condition to the point of the finished airplane. Conservation develops and maintains the handbook for "parts handling." This information is all prepared in conjunction with manufacturing, stockroom and quality control personnel. It covers requirements for each category of part, shelf life where applicable, storage requirements, etc.

Altogether, Beech has in operation a variety of programs each designed to meet specific problems, but at the same time interlocking one with another to improve both quality and output.

# ACTION PROGRAM OF A MIDWEST UTILITY

## The Detroit Edison Company

### Detroit, Michigan

*Detroit Edison's productivity improvement program is of particular interest because the company is a regulated public utility. Rate increases are granted by the State Public Service Commission conditional on the maintenance of maximum operating efficiency. Pressure of rising costs in 1972 caused the company to intensify its efforts to improve productivity. A top level Productivity Committee surveyed operations of the company's 65 departments, established a productivity training program for supervisors, and assisted departments in establishing measurement systems and action programs. Engineering and construction expenditures were also included under the productivity improvement program and contractors required to submit regular reports showing how they are monitoring unit costs and performance.*

The Detroit Edison Company, one of the Nation's major electric utilities, supplies electricity to the highly industrialized City of Detroit and to Southeastern Michigan, with a population of about 4.8 million. It employs about 10,000 workers and had operating revenues of over \$900 million in 1974.

Both coal and oil fired equipment are used for generating power and a large nuclear plant is under construction. The company has had serious problems in recent years caused by shortages and increased cost of fuels and the expense of converting equipment first from coal to oil to comply with environmental regulations, and then back to coal when the oil short supply situation developed.

## Background of Productivity Efforts

Detroit Edison has measured productivity from its earliest days as a corporation when it began making calculations of BTU's per pound of coal and megawatt output per employee. Since 1952, a comprehensive work simplification program calling for "continuous planned improvement through effective involvement" has been in operation at the company. Management-by-objective, value analysis and an employee proposal plan were included in this program. In 1972 the company management, under pressure of rising costs and rate regulation, saw immediate need to increase emphasis on productivity improvement and established the ACTION PROGRAM.

The Michigan Public Service Commission, in considering rate increases for the utility, has

allowed increases conditional on Detroit Edison's active pursuit of its efforts to improve efficiency. In granting a rate increase for the company in January 1974, the Commission order stated:

"The Commission shall permit this rate to remain in effect as long as there is a clear indication that the applicant's efforts to maximize its operating efficiency continue to be pursued. The Commission expects its staff and the applicant to establish mutually acceptable performance goals, particularly in areas of construction planning and management, full utilization of plant capacity and other critical items of general operations."

With an established relationship between rate approval and effort at improving productivity, Detroit Edison's productivity effort has become a significant adjunct to management's responsibility.

## ACTION PROGRAM Launched in 1972

ACTION (All Committed To Improving Operations Now) was launched in March 1972 by Company President William G. Meese at a meeting with 450 members of the management staff. In his speech launching the productivity program, he said:

"It is my intent to delegate decision-making to those who have responsibility for action. As we delegate more responsibility and authority for decision-making down the line, we must make certain that with this delegation goes accountability for results. This accountability

must be understood and accepted."

"Instead of just expecting results, we will evaluate and assist supervisors to assure desired results are attained. I believe the pairing of accountability with responsibility and authority will make us more responsive to the company's needs in this time of challenge and rapid change."

The ACTION PROGRAM consisted of three phases which were defined as follows:

- Phase I — Meetings with all employees about the program, and with supervisors on their role.
- Phase II — Sharpening up the company's Management-by-Objectives Program.
- Phase III — Establishing a Productivity Program.

## Phase I — Meetings with Employees and Supervisors

During the next few weeks, meetings were held with employees to communicate the substance of the president's meeting. Presentations dealing with the "company's financial picture" and "customer relations" were made to all employees. Sessions on "effective supervision" were held with supervisors to discuss "How the Effective ACTION Supervisor Works." Criteria established for supervisors called for them to:

1. Know the job, boss, employees, and others with whom they work.
2. Make things happen . . .
  - Plan for deliberate change
  - Act - not just react, and
  - Accept improvement as a way of operating.
3. Help the boss make better decisions . . .
  - Provide accurate information, and
  - Act as problem-solvers rather than problem-starters.
4. Build an ACTION team . . .
  - Define each job, get understanding and effective performance
  - Establish objective, keep score, let individuals know how they are doing
  - Provide recognition and correction
  - Go to bat for employees

- Become a person-builder, and
- Earn the respect of the team.

## Phase II — MBO Program Strengthened

Phase II of the ACTION PROGRAM began with a meeting early in 1973 of the company's Management Council for a presentation on "What a systematic Management-by-Objectives (MBO) Program would do for Detroit Edison."

The company has always had objectives, but under its renewed Management-by-Objectives Program, these objectives were to be made specific, measurable, and reportable, with a feedback system. The program called for specific corporate objectives and specific operational objectives for each department.

By the end of 1974, a number of key departments — Production, Engineering Research, Cash Management, Customer Service and Marketing, Data Processing, Real Estate and Rights of Way, and Stores and Transportation — were operating under the MBO Program. By that time, each department had established objectives and a system of productivity measurement.

## Phase III — Productivity Committee Established

Phase III zeroed in on the establishment of the productivity program itself. In December 1972, the company's Executive Management Committee appointed a Productivity Committee, consisting of seven key officials, and chaired by the General Auditor. Scheduled to become effective January 1, 1973, its assigned task was to:

- Determine the potential for increasing productivity in company operations through improved methods, standards, and controls in the technical, field and office areas.
- Recommend organization and staffing for support services to achieve increased productivity through improved methods, standards and controls.
- Evaluate services of professional consultants who might be utilized for advising on or installing systems for improving productivity.

- Recommend a course of action to initiate programs with potential for increasing productivity and decreasing costs in the company.

The Productivity Committee was instructed to provide monthly progress reports to the Corporate Planning Committee and, by March 1, 1973, to submit a preliminary report containing recommendations and programs for consideration by the Corporate Planning Committee and Executive Management Committee.

## Survey of Company Productivity Measurement

As its first action, the Productivity Committee surveyed the company's 65 departments to find out what they were doing to measure productivity, and what technical assistance they needed to do the job. Since Detroit Edison's organization plan assigns responsibility for operations to the departments, each department head was asked to make a presentation personally to the committee to provide the information called for in the survey. In summary, the presentations showed that:

- Half of the employees were formally measured on productivity, predominantly those in production, transmission and distribution, engineering, maintenance, and construction activities.
  - A few departments needed better productivity measurements.
  - Some departments needed help in developing good measures of productivity.
  - Several departments felt their work did not lend itself to measurement.
  - Some departments measured productivity annually, others periodically during the year.
  - Most difficult question for department heads to answer was "How many people do you really need to perform your assigned function?"
  - There was a lack of uniformity among departments in defining productivity.
- The Committee's conclusions were that:
- There is no magic formula for measuring and improving productivity in the utility industry, or elsewhere.
  - The company's department managers are best qualified to determine how to measure pro-

ductivity in their departments, and how to improve it.

- No outside consultants are needed at this time to help with the job.
- Technical assistance in productivity measurement can be provided by staff groups as needed.
- To make improvements in productivity, management at all levels must plan deliberate action to maintain acceptable productivity levels and improve those levels.

The Productivity Committee submitted its findings and conclusions to the Executive Management Committee and reported increased emphasis on productivity training with the following activities added:

- Productivity analysis as a topic in management training seminars.
- Productivity as a main topic in departmental seminars.
- Discussion meetings with management staff on productivity indicators.

## Company Objectives

The Productivity Committee's findings and conclusions provided the guidance needed by Detroit Edison's management to shape the productivity improvement program and to establish reasonable objectives for measuring and improving productivity.

The primary company objective was to improve individual and overall performance effectiveness. To accomplish this, it was necessary first to measure the productivity of individuals and departments to identify areas of over-staffing and under-performance. This requires the establishment of a measure of productivity and an acceptable output standard for each major activity, and a comparison of actual output with the standard.

Periodic reports that compare actual output of departments or groups with their work performance standards and their objectives will identify those groups with below-standard results, where improvement efforts are needed. Decision must then be reached between the supervisors and their superiors on remedial measures to be taken - such as work scheduling, employee training, procurement of more efficient equipment, and setting up work teams.

It was found as the company program progressed that some improvement in productivity was achieved just because a measuring system had been established - because groups and individual employees knew exactly what was expected of them, and that they were measured on their performance.

Potential for largest productivity improvement was found to be in the following areas: repetitive tasks, bottleneck areas, areas with frequent errors, tasks involving several groups, high labor cost areas, jobs requiring considerable movement of manpower or materials, and areas where two or more organizations do similar work.

## First Productivity Seminar

The company's first Productivity Seminar was held in July 1973, to update department heads on the status of the ACTION PROGRAM and to demonstrate top management's support for it. In opening the meeting, the Administrative Vice President called for full cooperation in the program's objectives, and announced that the purpose of the meeting was to:

- Emphasize the basic responsibility of department heads for developing and monitoring productivity measurement.
- Demonstrate the relationship between productivity measurement and the company's Management-by-Objectives Program.
- Hear presentations by department heads of their experiences in attempting to measure productivity.
- Display company productivity indicator trends.
- Describe future plans to formalize productivity measurement on a company-wide basis.

The Productivity Committee chairman announced the company's objective to increase the number of employees measured for productivity from the then current 50% to 75% in 1974. He said additional meetings and seminars would be held to accelerate action on the program.

Heads of six diverse departments — Engineering Research, Transmission and Distribution, Generation, Stores and Transportation, Real Estate and Rights of Way, and Cash Management — presented their experiences in de-

velopment of productivity measurements. These talks and the discussion period that followed provided practical guidance to department heads on how to establish or improve their methods of measuring productivity.

## Program Accelerated

After the seminar, the departments accelerated their efforts to improve or develop productivity measurement of their activities. Under the new procedure to formalize productivity measurement on a company-wide basis, each department submitted its measurement plans to the Productivity Committee for clearance. To assist the departments, the Productivity Committee held training sessions, provided technical assistance on an individual basis, and issued a booklet on productivity improvement. Periodic bulletins were sent to department heads and supervisors by the Productivity Committee, and all employees were communicated with through the house organ "Detroit Edison Today."

## Productivity Improvement Training Material Issued

Training material was issued to provide management with guidance for improvement of productivity. The material updated management on overall company productivity, provided examples of good productivity measures that were being used by various departments, and emphasized the corporate commitment to improve productivity on a continuing basis.

The three elements of productivity were discussed — (1) defining activities to be measured, (2) determining productivity measures for these activities, and (3) establishing acceptable standards of productivity. Ideas for improving productivity were listed and areas most susceptible to improvement were pointed out.

Department managers were assigned primary responsibility for measuring productivity in their departments because of their familiarity with overall operations - functions performed, resources used, all related costs, and results obtained. Technical assistance was to be provided, as needed, by staff groups in such areas as determining output measures or establishing acceptable standards of productivity.



## Establishing a Productivity Measurement Plan

Guidelines prescribed in the training material for departments or groups in establishing methods of measuring productivity call for the following steps:

1. Name the major functions of the department.
2. Define the activities to be measured. These should encompass at least 90% of the department's functions, costs, and outputs.
3. Establish productivity measures for each activity. This was described as a key step requiring careful study and consultation as follows:
  - Discuss with supervisor and subordinates the proposed output measures. Seek their reaction and ideas.
  - Consider applicability of measures used by other departments.
  - Test proposed measures against the following criteria:
    - (a) Does the measure directly relate input of resources (money, equipment, manpower) to output (i.e., megawatt output, miles of lines maintained, number of meters read, number of customer contacts)?
    - (b) Are the measures easily understood by those performing the activities and by the supervisor?
    - (c) Are data required for measuring available from present reports? If so, is the reporting system accurate and timely? If data are not available, can an inexpensive reporting system be developed?

4. Establish acceptable standards of productivity for each activity. Use of the following techniques and procedures was suggested for establishing standards in measuring work performance:

- Time study
- Work sampling
- Predetermined time systems
- Standard data
- Technical estimates
- Historical estimates

Technical assistance may be needed to determine which technique to use and how to apply

it in establishing a work performance standard.

5. Establish objectives and put plan into effect. After productivity measures and work performance standards have been established for each activity, the productivity measurement plan is ready to be put into effect. Year-end objectives must now be set for each activity. Meetings must be held with supervisors and employees to insure that they understand the plan. Periodic progress reports must be provided to all levels of management indicating performance, plus or minus, for each activity.

## Second Productivity Seminar

A second Productivity Seminar was held in March 1974, opening with a talk by the chairman of the Productivity Committee on program progress and future plans. After the general session, five workshop groups were formed at which department representatives told about productivity measurement systems that were in operation in their departments and listened to suggestions for measuring the quality of work.

Because its engineering and construction expenditures are large, amounting to several hundred million dollars a year, Detroit Edison extended its productivity improvement program to this area. The Project Management Department was instructed to establish and maintain complete monitoring controls over all construction dollars and to arrange for submission of regular reports from major contractors to provide the information needed. Contractors were also asked to provide information on how they were monitoring unit costs and performance.

## Program Progress

A progress review by the Productivity Committee in October 1974 showed that 8,300 or 80% of the company's 10,400 employees were being measured for productivity. This exceeded the 1974 objective of 75% and compared with measurement of only 50% of the employees just 18 months earlier in March 1973.

The review showed that about one-third of the departments were measuring all of their employees for productivity, and that only a few departments — such as Planning and Public Affairs — had not been able to establish mea-

surement systems. A number of departments reported productivity improvements, but most had not had plans in effect long enough to have this information.

During the past several years, Detroit Edison has been severely pressed between rising costs and rate regulation and has had to find ways to reduce expenses. One area selected for curtailment was staff, but the company was able to obtain the required reduction by planned attrition without layoffs. The ACTION PROGRAM

helped management in this task by identifying those parts of the organization where reductions could best be made with least effect on overall company objectives.

The company's objectives for 1975 are to complete an inventory of jobs that cannot be measured, and to further increase measurement of employee productivity beyond its 1974 successes. Accomplishment of these objectives will point the way to additional possibilities for improving productivity.

# A COMPUTER MANUFACTURER'S DECENTRALIZED PROGRAM

Honeywell, Inc.  
Minneapolis, Minnesota

*Honeywell's corporate-wide productivity program was initiated jointly by the Chairman of the Board and the President. It calls for annual corporate productivity improvement goals and requires each corporate officer and division manager to be responsible for programs to meet these goals. A Steering Committee is responsible for program policy, and jointly responsible with the Productivity Administrator for helping the company's 20 divisions initiate their programs. Division managers make the final decision regarding their own program and report progress at quarterly corporate meetings. Largest productivity gains are expected in white collar areas — sales, engineering, clerical and administrative departments.*

Honeywell, Inc., is a major U.S. industrial corporation specializing in electronic computers, systems and controls. It has approximately 88,000 employees and had sales of \$2.6 billion in 1974.

The company is reported to be the second largest factor in the computer industry, the largest producer of controls for domestic heating and air conditioning systems, and a major producer of environmental control systems for buildings and process control systems for industry.

Sales in 1974 were divided by major product groups as follows: computers and communications - 47%; automation systems and controls for homes and buildings - 19%; aerospace and defense - 16%; automation systems and controls for industry - 16%; photographic products - 2%.

The company has some 50 manufacturing plants, laboratories and major warehouses located throughout the United States and more than 25 in foreign countries. Sales in foreign markets, including U.S. exports, represented 41% of the company's 1974 revenues.

## Top Management's Views on Productivity

Honeywell sees increase in productivity as a "partial but an important" answer to "unbelievable world-wide inflation," with the best effort of the workforce as the next big opportunity to improve company profits.

So convinced is the company management of the promise of productivity improvement that

they have built a company-wide program around the idea. Stephen F. Keating, Chairman of the Board of Directors of Honeywell, in a speech to the Minneapolis Kiwanis Club in July 1974, expressed the belief that productivity applies in every kind of venture.

"In recent years," he stated, "I've heard a good deal about emphasizing the efficiency of production. Not just more production, but more output for every unit of input. When we thought of resources as infinite, we didn't have to worry so much about input. But today we view our world as one of limited resources — and with that comes the realization that we'd better find ways to do more with the resources we have."

## Productivity Improvement Program Initiated

Honeywell's "Productivity Improvement Program" was initiated in September 1973 by a policy memorandum issued jointly by the Chairman of the Board and the President of the company.

After the change in top management in 1974, the company's commitment to the program was reaffirmed by Edson W. Spencer, the new President, and Mr. Keating, former President, in his new role as Board Chairman.

The company memorandum, initiated at the highest company level, stated that it was considered essential that plans be put into effect in 1974 to improve operating efficiency throughout the company in order to strengthen its competitive position and provide greater flexibility for responding to changing economic conditions.

As an immediate goal, the memorandum called for an improvement in the company's overall productivity ratio in 1974. Each of the company's 20 operating divisions which are structured along product lines was instructed to prepare a plan for increasing its productivity.

Each of the operating divisions has a general manager who has full responsibility for its operations, which has led to somewhat differing structures in their productivity improvement programs.

The decision to launch a company-wide Productivity Improvement Program was made after more than a year of study at the corporate level and after holding productivity seminars with the Corporate Management Council, as well as with functional groups such as division general managers, purchasing managers and training managers.

A few weeks after issuing the policy memorandum the President held a meeting with corporate officers and general managers of the company's operating divisions to announce formation of the Corporate Productivity Steering Committee. He described its functions and responsibilities, and asked division managers to take productivity into account in their planning and to cooperate with the committee.

Five key officials were named to the Committee, with the Vice President for Administration designated Chairman. The Corporate Director of Human Resources was assigned responsibility for the Committee's operations. A Corporate Productivity Administrator was appointed to provide day-to-day implementation of the program. The Committee and the Administrator were given joint responsibility for development of a program to educate and assist the divisions and functional groups in measuring and improving productivity.

## Honeywell's Philosophy on Productivity

As to the overall approach to the problem, Board Chairman Keating, in his speech to the Kiwanis, indicated that the company program was heavily committed to the concept of total involvement by everyone.

He went on to say:

"At Honeywell, our emphasis on productivity

spotlights our people. They are our most significant resources, since our business depends so much on craftsmanship and brain power. And they are far and away our most expensive resource; our payroll is 50% of total operating costs.

"We expect that most of our gains in improving productivity will come in white collar areas — sales, engineering, clerical and administrative departments. There are a couple of reasons for this. For one thing, in most industries about two-thirds of the employees work in non-production areas. Secondly, factories have traditionally had well-established ways of measuring productivity, but in office areas these procedures have not been worked out. So we believe offices represent largely untouched but fertile ground for productivity improvement.

"Getting new productivity requires new ways of thinking. This may mean re-thinking the traditional relationship between worker and supervisor, giving the employee more latitude in his own area of responsibility. . . . We believe the key is to let everyone do as much as he can, take all the responsibility that he can, make his job as interesting and important as he can. The personnel people call it Job Enrichment.

"In our program, we're asking everyone — management, supervisors and each employee — to get involved. It's a participation game — inspiration has to come from the top, but often the best ideas come from the bottom up. And we're not asking our people just to beef up a numerical ratio, but to make their own jobs more interesting, challenging and personally rewarding."

## Productivity Improvement Training Program Developed

By March 1974 the Corporate Training Department had developed a program for managers and supervisors to:

- Provide them with an understanding of the concept of productivity.
- Create an awareness and understanding of the part productivity plays in industry and Honeywell.
- Describe the tools, measures and techniques for improving productivity.
- Provide information regarding the major

factors affecting employee productivity.

- Instill a desire to apply productivity thinking to on-the-job concerns.

The program was designed to be flexible to meet the interests and requirements of the diverse groups to whom it would be presented. It could be conducted as a two-day seminar or as a series of 2-3 hour workshops, or compressed into one 2-3 hour seminar for upper management. In addition, since Honeywell is managed in a decentralized pattern, some operating divisions would elect to conduct their own training programs using materials and instructions provided by the Corporate Training Department.

The training material was expanded and improved during the year to meet the needs of the program and formed the basis of a Productivity Manual that was issued early in 1975.

## Viewgraph Presentation of the Training Program

The training program includes a viewgraph presentation that summarizes it and shows the next steps in the Productivity Improvement Program. The following subjects are covered:

- **Productivity** is defined as the relationship between the quantity of goods and services produced and the quantity of resources required to produce them. In other words, **output divided by input**.

- The five ways of increasing productivity:

- (a) Increase output more than input.
- (b) Increase output without increasing input.
- (c) Decrease output but decrease input more.
- (d) Maintain same output but decrease input.
- (e) Increase output and decrease input.

- Possible productivity measures:

$\$ \text{Sales} \div \text{Employees}$   
 $\$ \text{Sales} \div \text{Total Pay}$   
 $\text{Factory } \$ \text{ output} \div \text{Total Mfg. Pay}$   
 $\text{Total Employees} \div \text{Personnel Employees}$   
 $\text{Drawings (weighted)} \div \text{Draftsmen}$   
 $\text{Accounts receivable} \div \text{Credit Employees}$

- Major Factors Affecting Employees' productivity (adapted from the work of R. Suitermeister, University of Washington):

### I. Ability

- A. Skills acquired through education, training, and experience.
- B. Aptitude and personality.

### II. Motivation

- A. Individual Needs.
  1. Cultural background.
  2. Economic conditions
  3. Personal situation.
  4. Reference group the individual identifies with or aspires to.
  5. Level of aspiration.
- B. Organization Conditions.
  1. Formal Organization.
    - (a) Organization structure
    - (b) Working conditions
    - (c) Management climate
    - (d) Communications
    - (e) Personnel practices
    - (f) Leadership
    - (g) Union influence
  2. Informal Organization
    - (a) Group dynamics
    - (b) Cohesiveness of group
    - (c) Peer standards

- Productivity Improvement Tools:

- (1) Effective supervision.
- (2) Automation.
- (3) Work simplification.
- (4) Work measurement.
- (5) Job enlargement, job redesign.
- (6) Systems analysis and design.
- (7) Manpower management - recruiting, staffing, training, upgrading, and marginal employees program.
- (8) Incentives.
- (9) Training.

- Obstacles to Productivity Improvement:

- (1) Parkinson's law - people readily adjust to doing less and less.
- (2) Lack of goals.
- (3) Lack of a plan.
- (4) Lack of emphasis from top.
- (5) Lack of training.
- (6) Wrong organization.

- To measure overall company productivity, Honeywell selected the "ratio of sales (in dollars) to total employees" - i.e., sales dollars per

employee. Calculations on this basis for 1973 and 1974 showed sales per employee of \$24,363 and \$28,486 respectively.

However, with the rising rate of inflation, both in terms of price increases and wage and salary adjustments, it was decided that in 1975 the overall employee productivity measure had to be refined to reflect inflation and include the cost of people.

- The present overall measure of employee productivity is the ratio of Sales to Pay. Pay is defined as the sum of wages, salaries, and fringe benefits.

- Honeywell's principal opportunities to improve productivity are considered by management to be in the non-factory area because:

- Most of the gains in productivity at Honeywell, and in industry generally, have taken place in the factory where there have traditionally been well-established ways of measuring productivity and where improvements have been realized through improved technology, machines, and methods.

- Seventy percent of Honeywell's employees work today in the non-factory area where less has been done to measure productivity. For this reason, this area is thought to be fertile ground for productivity improvement. In the 1950's, seventy percent of Honeywell workers were in the factory area but primarily because of automation, a gradual turnaround in the organizational mix has taken place.

- While the formal program has been underway a relatively short time, there are detailed plans for the collection of productivity data, establishment of goals, development of techniques for measurement of productivity, including decisions of what to measure as well as programs for the implementation of productivity improvements and the monitoring of progress.

Just as the original decision to establish a program was made by top management, corporate level has responsibility to (1) establish overall goals, (2) further develop and refine the productivity improvement program, (3) monitor, and (4) provide staff support to divisions.

Each operating division under its general manager is responsible for (1) distributing its goal to departments, (2) planning its program, (3) making studies and gathering data at the

department level, (4) monitoring, and (5) providing staff support for departments.

## Division Implementation of the Program

Participation in the program at the division level begins with the holding of productivity improvement training sessions at division headquarters attended by the general manager, productivity coordinator, department heads, and supervisors. Productivity coordinators were appointed in each operating division by its general manager during the latter part of 1974 to assist in implementing the program and to be the division point of contact with the Corporate Productivity Administrator. By the end of 1974, three-fourths of the divisions had held training sessions and the others did so early in 1975.

The division general manager then appoints a task force or division productivity council to plan and guide the program and requests department heads and their supervisors to identify productivity measures (outputs/inputs) and to set goals for their operations. The division goals, like the overall company goal, are expressed in terms of Sales to Pay, but department goals are set in terms of the productivity measures they adopt.

The departments may adopt any productivity measure that directly relates input of resources to output, and for which past and current data are readily available. The measures they select are reported back through the general manager to the Corporate Productivity Administrator for comment. However, the role of the Productivity Administrator is to advise and assist, and the final decision regarding the division's program lies with its general manager.

Department heads and supervisors review their operations to seek out areas in which productivity can be improved. The department head is responsible for productivity of his department, and he and his supervisors proceed with changes and actions needed for improvement under established policies and procedures. While principal emphasis is on use of human resources, capital investment opportunities are also considered.

Division general managers reported to the Corporate Productivity Committee on the status

of their productivity programs in July 1974. Their reports showed progress against dollar sales goals and indicated the techniques being used to increase productivity. Twelve of the divisions had put into effect three or more productivity improvement techniques. Qualitative assessment of division progress is made at regular meetings of corporate officers and division managers.

## First Meeting of the Productivity Coordinators Council

The Honeywell Productivity Coordinators Council, Consisting of the Corporate Director of Human Resources, Corporate Productivity Administrator and the Division Productivity Coordinators, held its first meeting in February 1975. The members of the Corporate Productivity Steering Committee attended as guests. Objectives of the meeting were to:

- Review progress of the Honeywell program.
- Exchange ideas on specific divisional programs.
- Discuss 1975 plans and the new productivity measure, Sales to Pay.
- Discuss the practicality of an organized Productivity Council. Develop and agree on a charter for the Council.
- Review available training and program materials.

The Productivity Administrator reported that during 1974: (1) productivity seminars were conducted in 14 operating divisions and for 10 corporate functional groups; (2) a Productivity Training Manual was prepared; (3) the Productivity Coordinators Council was evolved; (4) relations were established with government and private groups concerned with productivity; (5) information was provided to numerous companies seeking advice on how to start a productivity program. Copies of the Productivity Training Manual were distributed at the meeting.

Reports by Division Productivity Coordinators indicated wide variations in the divisions' progress during 1974 in establishing productivity improvement programs. Most divisions had made good progress in spite of declining sales and accompanying reassignments and lay-offs.

Programs put into effect most widely by the divisions were: work simplification, cost reduc-

tion, manpower utilization, and productivity communications programs. Among other programs adopted were: production teams, marginal employees, suggestion system and flexible hours. There were detailed presentations by Division Productivity Coordinators of five specific programs their divisions had adopted. Three of these — SCOPE, Flexible Hours and WHY? — are programs of particular interest.

**"SCOPE"** (System of Controls for Objective Planning and Evaluation) is a management program designed to evaluate the productivity of office and technical groups. It involves establishing "time per task" by relating output volume during a test period to the time required to produce that volume. A measure of productivity can then be obtained by comparing actual "time per task" with the results obtained during the test period. Prerequisites for a workable system are (1) tangible units of output which represent workload, and (2) work that cycles periodically.

**"Flexible Hours"** emphasizes results rather than rigidity, but stipulates that the work of the department be completed on time with a high degree of quality at minimum expense. For example, in one data preparation department the control of hours worked is placed in the hands of the employee except for a "core time" of 10:30 a.m. to 3:30 p.m. (for the day shift) during which all staff will normally work. Under this approach the employee is able to match his work hours to his needs, desires and lifestyle. The employee is given some responsibility for adjusting his work hours to meet varying workloads.

**"WHY?"** is an adaptation of the work simplification program designed to help employees solve their own problems. It involves no efficiency experts or consultants, and is built on the premise that no one knows a job as well as the person doing it. Any employee, or team may select any job, operation or situation and develop an improvement idea for submission to the WHY Committee. Recognition is given for ideas accepted and a record placed in the proposer's personnel file. Incentive awards are not given.

In a talk on "The Division Productivity Coordinator's Job" the Productivity Administrator provided general guidance for discharging the

responsibilities of the job. He discussed program ideas and emphasized the importance of a communications program to assure that all employees understand what the productivity improvement program is all about. He identified the eleven key elements of a successful program as:

- Top Management Support.
- Productivity Steering Committee.
- Productivity Coordinators.
- Meaningful and Realistic Definitions of Productivity.
- Top Down Program of Stimulation and Awareness.
- Effective Communications.
- Seminars and Training for Supervisors
- Participation of all Employees.
- Goals and Objectives.
- A System for Measuring, Monitoring, and Reporting.
- Information Resources.

At the conclusion of the meeting, the Corporate Productivity Steering Committee held a panel discussion on the overall program and its importance to the company and responded to

specific questions from Council members.

Based on the input from the meeting, a charter and objectives for the Productivity Council were developed and submitted to the Corporate Productivity Steering Committee for approval. The role visualized for the Council is that it would serve as a forum for:

- Keeping all informed of good practices.
- Sharing ideas and techniques.
- Critiquing the corporate position and program.
- Contributing to organizational effectiveness.
- Ensuring consistency of effort.

## Productivity Newsletter Issued

Publication of a monthly Productivity Newsletter by Honeywell, beginning in March 1975, was an important addition to the company's productivity communications program. The newsletter is intended to serve as a means for communicating good ideas and techniques, and information concerning Honeywell productivity activities.



## PROGRESS THROUGH RESEARCH AT A CHEMICAL PRODUCER

### Thiem Corporation Milwaukee, Wisconsin

*Thiem Corporation has put into effect a variety of policies and programs to improve productivity which were developed by company executives based on their personal philosophy and experience. The success of these policies and programs is indicated by the company's growth and increased productivity. The most important of these are: (1) a management-by-objectives plan; (2) an intensive research and development program; (3) an employee relations policy based on the concept that the employees are the company's most valuable asset; (4) a profit sharing and retirement plan that enables employees to share directly in the company's success.*

Thiem Corporation is a medium-size industrial chemicals company which makes some 200 formulated, consumable products that are used in the manufacture of automobiles, appliances, foundry products, specialty steels, galvanized products and non-ferrous metals. The company's sales for its 1974-75 fiscal year were \$23.6 million and it has 280 employees.

Distribution of sales by the company's four divisions in 1974-75 was as follows: Foundry Materials - 56%; Steel Industry Products - 26%; Specialty Chemicals - 12%; and Ferrous and Non-ferrous Metal fluxes - 6%.

Thiem has five U.S. plants located in Wisconsin, Illinois and Pennsylvania, and one in Canada, and has licensees in England, France, Italy, and Germany to which product-concentrates are shipped for finished product formulation and sale. Thiem also has entered into a joint venture with their French licensee to produce and distribute metal fluxes.

### Productivity Improvement Programs and Policies

The Thiem Corporation has developed a variety of policies and programs to improve productivity without designating them as a formal "productivity improvement program." They were developed by company executives based on their own personal philosophy and experience, and without the services of outside consultants. These policies and programs have resulted in substantial company growth and marked improvement in output. The most important are:

- A management-by-objectives plan.

- An intensive Research and Development Program that provides the company with new and improved products.

- An Employee Relations Policy that is based on the premise that the company's most valuable asset is its employees.

- A Profit Sharing and Retirement Plan that enables employees to share directly in the success of the company.

### Management-by-Objectives Plan

Thiem's management emphasizes the concept of "properly channeled individual initiative." This basic philosophy is implemented by operating each of the company's four divisions as a separate profit center. Divisional forecasts and budgets are consolidated into a corporate profit plan which fully details the measures required to attain corporate objectives. Appropriate follow-up controls keep the plan on course.

### Research and Development

At Thiem, research and development has been "a key to the success of the firm" according to Darold W. Thiem, founder of the company and now Chairman of the Board. Ten percent of the personnel work in R & D at nine company laboratories which provide the environment and operations needed to develop and test new products, and conduct research to find solutions to individual customer problems.

Thiem's research and development capability is given credit for much of the company's

progress to date and is expected to make a major contribution to future growth. The R & D team's contribution includes:

- Development of new and improved products.
- Adapting product formulas to keep customers supplied when raw materials are in short supply or costly - as happened in 1973-74.
- Problem-solving for customers to provide tailored solutions to meet their special needs.
- Development of products and application methods that help customers meet health and safety standards, reduce pollution, save energy and reduce production costs.

The company cites as examples of products developed by their R & D operation within the past several years: (1) non-ferrous metal fluxes that reduce smoke and fume emissions and improve in-plant environment for non-ferrous smelters, die casters and galvanizers; (2) dust-free, heat-resistant refractory materials that help foundries meet environmental regulations; (3) self-hardening sealants, coatings and binder systems that eliminate need for costly drying operations, thereby saving energy and reducing customer costs; (4) a "hot top" system used in producing steel ingots which provides greater metal yield and superior metallurgical results.

The R & D effort has been a major factor in the company's growth and productivity improvement. New product development has increased diversification of the product line and expanded the company's market. Product improvement has enabled greater market penetration. Economies of scale, both in production and marketing have been the result.

## Employee Relations Policy

A "Declaration of Policy" outlining the principles that govern the company's relations with its employees is contained in the employee handbook.

Essentially, the relationship within the company is one of an open door between management and the workforce — open to discussion "in friendliness" on any issues involving requested improvements in working relations, in personnel policies or practices.

In keeping with this policy, it is company practice to hold employee-management meet-

ings which are attended by all employees, plant supervisors and one or more company officers at each plant every two months. These meetings provide an opportunity for communicating information to employees and for open discussion of conditions and situations that constitute problems. Employee questions are discussed and suggestions for improvement of operations or work conditions are considered. Employee representatives participate in setting agendas for meetings.

The company also undertakes to pay wages which compare favorably with prevailing area rates for similar work, and to consider and discuss any complaint, and provide fair and prompt settlement through procedures set out in a "Fair Treatment Policy."

Under this policy:

- Employees are urged to discuss with their supervisors any conditions that cause dissatisfaction on the job.
- Employees are encouraged to submit suggestions and problems through suggestion boxes to assure their consideration since only a limited number of matters can be brought up at employee/management meetings. Problems that are urgent are handled speedily and written answers supplied which are then posted on bulletin boards.
- Personal problems are discussed first with the employee's supervisor. If a satisfactory solution is not arrived at, a meeting is arranged with the production superintendent. If the employee is still not satisfied, a meeting is held with the works manager, who reviews the entire issue, and seeks to reconcile the complaint.

## Communications with Employees

Communications with employees is recognized by Thiem as a matter of highest importance. The employee handbook has this to say on the subject:

"We want you to have full knowledge of all facts relating to your job and the company. It is the policy of the company that our people get the news first. Therefore, we maintain a vigorous policy of reporting news and information.

"The company wants you to have a clear understanding of all its policies and practices to make certain that you know why things are

done and that no one, in or out of the company, misinforms you about the company. . . .

"Your best source of authentic company information is the employees' bulletin board which you will find close to your work area. Please make it a daily practice to read the bulletin board. . . .

"Occasionally, as matters of major importance arise, information will come to you in letters addressed to your home. This is done to enable you to read lengthier communications at your leisure and discuss their contents with your family, if you wish. We like to feel that your families, too, are well-informed on what is going on within the company."

## **Wages and Productivity**

The company ties in its wage policy with productivity pointing out that "for the security of the business and all of our jobs, higher wages can be justified only through better efficiency and greater productivity." Without this justification, product prices have to be increased which will result in loss of business to competition.

Wage rates and all other benefits are reviewed each year at which time suggestions from employees are invited. To assure that pay for individual employees is fair both in relation to the work they do and the work of other employees, the company has established the following factors for use in all wage rate determinations: (1) skill and ability, (2) judgment and initiative, (3) responsibility, (4) physical effort and aggressiveness and (5) working conditions.

## **Profit Sharing and Retirement Plan**

A significant factor in employer-employee relationships at Thiem is the company's Profit

Sharing and Retirement Plan which has been in effect since 1953. Its objectives are: (1) to provide employees with the opportunity to share directly in the profits and growth of the company; and (2) to provide income for them upon retirement. Under the plan, the company makes annual payments based on profits to the "Employee Profit Sharing Trust" which is administered by two trustees and two plan administrators. A booklet distributed to all eligible employees describes how the plan operates.

The success of the plan, according to the employee handbook, "continually depends on the quality and efficiency of everyone's work efforts. Successful profit sharing does not just happen. It depends upon the profitable operation of the company through the cooperation and efficiency of all employees." All employees are allowed to share in the success of the team effort, and they are also expected to share the responsibility to contribute to that effort.

The plan's success to date is affirmed by the record which shows that the company has made maximum payments (15% of total employee compensation) to the fund in 20 of the 22 years of its existence.

The company's operations for their fiscal year ending March 31, 1975, just announced, showed a substantial increase in both sales and profits over the previous year — so the maximum payment will again be made to the fund. In announcing the year's results, Thiem's President, Peter E. Barry, said "operational efficiency continues to improve and productivity is up." He credited the firm's record performance to efforts by employees which helped the company "overcome serious challenges and make excellent progress despite a down economy."

## COMMUNICATIONS AT A MAJOR STEEL CORPORATION

### United States Steel Corporation Pittsburgh, Pennsylvania

*U.S. Steel's productivity effort is based on the mutuality of interest between labor and management in increased output and lower costs, and is supported by an agreement with the United Steel Workers of America (AFL-CIO) to cooperate in making the company plants more productive. With this primary objective, the company developed a major campaign to emphasize to the workforce — both white collar and blue collar — the need for productivity improvement both to insure their jobs and maintain their rate of pay. Significant results of the program at many plants are reported as including reduction in tardiness and absenteeism, gains in preventive maintenance, improvement in product quality and an increasing awareness of costs.*

U.S. Steel is the Nation's largest steel producer. Its sales amounted to \$9.3 billion in 1974, and it has 185 thousand employees.

The company is engaged in integrated steel operations, producing and selling iron, steel and related products in a variety of forms. Pig iron, ferromanganese, coal chemicals and raw materials related to iron and steelmaking activities are also produced and sold. The company produces almost all of the iron ore and limestone it uses and two-thirds of the coal; operates coke ovens that supply coke, coke oven gas and tar; generates a third of the electric power required; and operates steamships, tugs, barges, and docks for transportation of raw materials and products.

The company fabricates and erects bridges, buildings and other steel structures through a division that also produces barges, electric transmission towers and large diameter steel pipe. Other divisions manufacture steel drums, oil field drilling and pumping equipment.

U.S. Steel produces and sells chemicals, which are derived largely from its coal coking operations. These include agricultural chemicals, other industrial chemicals and basic materials for the plastics industry. The company is also a major producer of cement which is made in part from blast furnace slag.

### Background for the Program

Productivity improvement at U.S. Steel has become much more than an undertaking. It has taken on the proportions of a crusade, not only within the company to stimulate greater output

per manhour, but beyond that as a national effort to spur improved production throughout the economy.

In the case of the steel industry as a whole, and U.S. Steel specifically, the initiation of special productivity programs came at a time when conditions made it plain that there was a genuine mutuality of interest between labor and management in increased output and lower costs.

The decade of the 60's was one which saw steel imports take a rising share of domestic steel markets, resulting in a loss of jobs and creating concern over the domestic industry's ability to compete. The impact of inflation added to the problem, and the uncertainty of continued labor peace caused cyclical inventory buildup among steel users, followed by an inevitable drop in orders after steel labor contracts were concluded.

All this contributed to uneven production schedules and employee layoffs, which led both management and labor to seek a basis for improved stability in labor-management relations.

The 60's was a decade of relative labor peace, and labor and management discussed and explored mutual remedies to the problem of increasing inroads from imported steel.

It was against this backdrop that the steel industry and the United Steelworkers of America negotiated a contract in 1971 that included a landmark feature — agreement to establish a mechanism of continuing discussion between labor and management on productivity ideas. The intention was to enable both sides to talk

over, develop and implement ways to make steel plants in this country more competitive.

Indicating the alarm within the steel industry, the then Chairman of U.S. Steel Edwin H. Gott in 1971 addressed a message through the company publication that:

"Although our tools of production are better than ever, our national productivity is not growing as it should . . . I sincerely believe that one of the most important tasks facing this Nation is to get the productivity of our manufacturing and service industries growing at faster rates. Those of us in the American steel industry must quickly take action in this direction, for despite heavy investments in new tools of production, steel output per manhour has hardly improved at all since 1966 — although employment and other costs have increased rapidly."

## Labor-Management Productivity Committees Formed

Efforts to organize productivity committees at the plants of U.S. Steel got underway soon after the 1971 agreement was signed. The committee structure has since been extended throughout the entire company operations. The labor agreement of 1974 clarified certain aspects of the joint labor-management program, and carried it forward as a part of the new contract. Over 100 committees were operative in 1974.

The underlying authority for the establishment of the U.S. Steel productivity program is stated in the current labor contract with the United Steelworkers (August 1, 1974) which points up the basic understanding that:

"The parties recognize that for their joint benefit, increases in wages and benefits should be consistent with the long-term prosperity and efficiency of the steel industry."

The agreement further states that "the parties are concerned that the future for the industry in terms of employment security and return on substantial capital expenditures will rest heavily on the ability of the parties to work cooperatively to achieve significantly higher productivity trends than have occurred in the recent past."

Under the agreement, a joint advisory Committee on Employment Security and Plant Productivity is called for in each plant. The Union

representation on the Committee consists of two union members in addition to the Local Union President and the Chairman of the Grievance Committee.

The Union members are certified to plant management by the Union. The Company and Union members of the committee meet at mutually agreeable times, but no less than once each month. The function of the Committee is to advise with plant management concerning ways and means of improving productivity and developing recommendations for stimulating its growth.

The General Plant Superintendent or the Local Union President may from time to time suggest to the Committee areas of special concern.

## Guidelines for Committee Operation

The agreement between the Management and the United Steelworkers outlines in precise terms how the union and management Plant Committee members function.

The agreement states:

- The Plant Committees are joint, cooperative ventures in which company and union representatives share in the mutual concern and obligations to improve the productivity of domestic steelmaking so as to provide employment security and assure continued Company growth. Accordingly, both parties should approach the Committee meetings and discussions with a positive and constructive attitude toward improving productivity through practical and mutually beneficial means. Meetings of the Committees should be conducted within this framework of common interest and the contractual directive to work cooperatively.

- The Committees are advisory, charged with the function at plant level to advise with Management concerning ways and means of improving productivity and developing recommendations for stimulating growth . . . Plant representatives should endeavor to identify those problems adversely affecting their performance and address themselves to the solution of those problems in order of priority.

- The Committees are free to discuss and consider any matters reasonably related to the common objective of improving productivity.

Such matters may include, among others, maximizing use of production time and facilities; reducing equipment breakdowns and delays; improving quality; reducing need for reprocessing products; eliminating waste of materials, supplies and equipment; reducing excessive overtime; boosting employees' morale; improving safety experience; and focusing employee awareness on the problems of productivity and those posed by the threat of foreign competition.

## Communications Key to Employee Support

With union cooperation firmly established, U.S. Steel has developed both an internal promotion campaign among its employees, and an external program for its customers and the general public.

For its internal program, U.S. Steel has organized an intensive communications program, with a specially prepared motion picture film as a direct message to company employees. The film is shown to plant-wide audiences, with the explanation:

"This film is not the company preaching at us. Productivity is a personal thing for each of us in labor and in management. Yet, improving it is a joint effort vitally important to all of us. So this film is talking to us about productivity. It's a series of interviews conducted recently with employees of U.S. Steel. 'How do you feel about productivity?' they were asked. 'What's it mean?', 'Why improve it?', 'What difference does it make?'. Their candid comments are the heart of the film . . . and this film is the focal point of the productivity campaign here at U.S. Steel. I think it says it all. In fact, an individual remark from one of our own people gave the film its title . . . Anything we can do, we can do better."

After the film is shown, the presenter seeks to personalize productivity improvement effort, pointing out that "productivity is a kind of a race that we run with ourselves in everything we do." It's a home addition, and a new car payment five, ten years from now.

Each attendee is given an employee "litter-bag" packet containing decals for locker, lunch box or hardhat; a bumper sticker for car or boat; a productivity campaign button; a magnet that

holds notes, bills, or reminders to any steel surface; a specialty item descriptive folder and order form, and an embroidered press-on symbol for purse or lapel for the ladies.

Finally, as a parting shot at the group meetings, attendees are told:

"Maybe you think you're already doing your best on the job. But spend some time thinking about it. And, maybe this is the most that can be asked of you — just to think about ways to do your job better. Only you know. Maybe it's a procedure that can be changed. Or maybe it's just a change in attitude. Are you proud of the work you do, and the way you do it? How can you do it better? Can anybody do it better? If you have any questions, let's hear them now. Farther down the road, if you have any suggestions to improve productivity, pass them on to your supervisor, or put them in the suggestion box. If you've been making suggestions all along don't stop now. Remember, Anything you can do, you can do better."

Those presenting the film and programs are prepared for some tough and critical questions from the audience. The company has discussed some of the things that might come up during a presentation, and suggested possible answers.

A questioner might ask "This productivity thing is a real smokescreen. I think it's just window dressing for a typical management scheme to get more work done by fewer people, and it's going to cost us a lot of jobs in the long run. Isn't that the real reason for this campaign?"

As a suggested answer, the company offers: "When you take the word productivity apart, you can make it mean whatever you want it to mean. In the kids' sweat shops of the 20's, productivity often led to exploitation. But in today's enlightened economy, it simply means — the only way we're going to get more for the work we do, more for ourselves, more for our families, more for the companies we work for. It stands to reason that if our company makes something better than another company makes, we're going to get the business and our employees are going to stay on the job. Improved productivity doesn't necessarily mean bigger output by fewer people. It simply means that what we turn out will be better than what the other guy turns out. Again, it just stands to

reason that the company that makes the best products at the best prices is going to be the company that stays around the longest and has a steady, solid workforce. Also, unless you improve your productivity, you're going to stand still - or even become obsolete. A lot of plants and businesses go down the drain because they can no longer compete. We sure don't want it to happen here."

Another, and similarly skeptical question — "this is all great for the company, but what's the payoff for me personally? Where do I get mine out of this?"

As a guide to answering such a question, the company suggests: "Sure it's great for the company. Improved productivity preserves the company. But it also preserves your job. And improved productivity can cover your annual wage increase too. And it sure can cut down arguments about how much increases should be. Something has got to pay for this, and improved productivity is a big part of that something."

In addition to the film, other activities that are a part of U.S. Steel's aids for productivity improvement include a wide variety of the approaches taken in a number of productivity improvement programs in companies across the country. These include in-plant publicity, intra-plant competition, recognition of the families of workers who are top producers, recognition of outstanding achievers among women, special recognition days, a speaker's bureau and trophies and awards. Just as the productivity program was initiated at the highest level of the company management, the program currently has enthusiastic top level support.

Edgar B. Speer, Board Chairman of U.S. Steel points up the company's productivity motivation with the statement:

"I'm sure you are aware of the problems that American industry faces today. Energy and materials shortages. Inflation at home that keeps driving up the cost of products we make. Widespread complacency that has crept up on us as a result of our long reign as the world's number one producer.

"It's all too clear that we have to meet these challenges. Happily, competition is something we Americans have a native feel for. We enjoy it, even thrive on it. Today at U.S. Steel our entire workforce is working hard to improve

its productivity, and our rallying cry is, anything we can do, we can do better."

## Supporting the National Productivity Effort

The program at spreading productivity improvement outside the company is the most visible part of the U.S. Steel effort. The company has used all segments of the mass media to spread the message of how productivity is promoted at U.S. Steel and the need for extending the effort through all segments of industry.

A national advertising program involving both the print and electronic media publicizes the productivity theme. The first ad featured a photograph and statement by I.W. Abel, President of the United Steelworkers of America.

It is felt among company officials that it is still too early to assess the successes of the productivity effort, but U.S. Steel officials say that in many respects they are pleased with the result they are getting.

Productivity committee efforts, company officials report, show varying degrees of interest, activity and success. Some are in the forefront of achievement. Others have been less successful. Discussions at committee meetings cover a wide spectrum of subjects. Typical among them are such topics as a reduction of mill delays, training techniques, equipment changeovers, locker rooms and sanitary facilities, parking lot conditions, lateness and absenteeism, customer concerns, better scheduling, product quality, preventive maintenance, environmental cleanup and cost awareness.

Significant results of the program at many plants are reported as including reductions in tardiness and absenteeism, gains in preventive maintenance, improvement in product quality and an increasing awareness of costs.

These gains, however, are regarded as evidences of progress, with the real emphasis at U.S. Steel on the recognition that productivity is literally the lifeblood of the industrial community; that it has been a major concern of businessmen since the industrial revolution; and that it is at the very heart of the rising standard of living experienced by those nations, particularly the United States, devoted to the economic progress of their citizens.

## A FEW SELECTED REFERENCES ON PRODUCTIVITY

### PUBLICATIONS OF THE NATIONAL CENTER FOR PRODUCTIVITY AND QUALITY OF WORKING LIFE

#### INDUSTRY STUDIES

*Productivity in the Food Industry*  
NCOP73001, 24 pp. illus.

*Backhaul in Food Distribution*  
NCOP75006, 24 pp.

*Measuring Productivity in the Construction Industry*  
CP75010, 104 pp.

*Technology Applied to the Food Industry (A Preliminary Report)* 32 pp.

#### LABOR-MANAGEMENT COMMITTEES AND QUALITY OF WORK PUBLICATIONS

*Employment Security and Plant Productivity Committee Ten Coordinating Steel Companies*  
(A Presentation by I.W. Abel, President United Steel Workers of America and Vice Chairman of the National Commission on Productivity and Work Quality) 12 pp.

*Pointers for Labor-Management Committees (Discussion Paper)* 20 pp.

*Labor-Management Productivity Committees in American Industry* NCOP, 59 pp.

*A Plant-Wide Productivity Plan in Action: Three Years of Experience with the Scanlon Plan*  
NCOP, 54 pp.

#### ECONOMIC INFORMATION PUBLICATIONS

*The Role of Productivity in Controlling Inflation* NCOP, 28 pp.

*Productivity and the Economy*  
BLS Bulletin 1779, 68 pp.

*Fourth Annual Report of the National Commission on Productivity and Work Quality*, 72 pp.

These publications are available from the National Center for Productivity and Quality of Working Life,  
2000 M Street, N.W., Room 3002, Washington, D.C. 20036.

#### U.S. DEPARTMENT OF COMMERCE

*Productivity and Technology Innovation – Selected Information Sources.* Bureau of Domestic Commerce, Domestic and International Business Administration, U.S. Department of Commerce, Washington, D.C. 20230

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\* The National Center for Productivity and Quality of Working Life established under Public Law 94-136 on November 28, 1975 supersedes the National Commission on Productivity and Work Quality. The Board of Directors of the new National Center had not been appointed, with the exception of the Chairman, Nelson A. Rockefeller, when this report went to press.

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