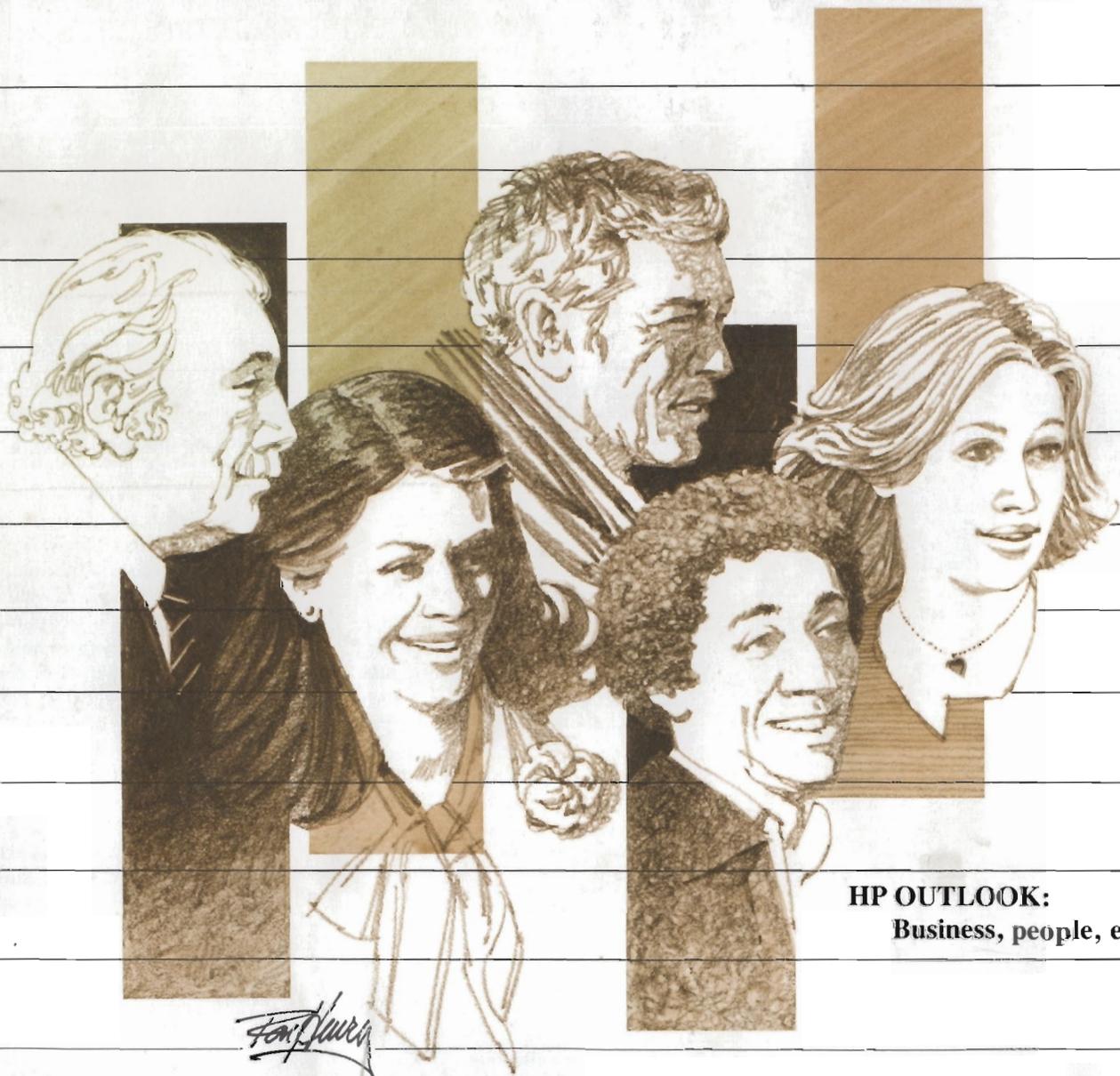


Measure

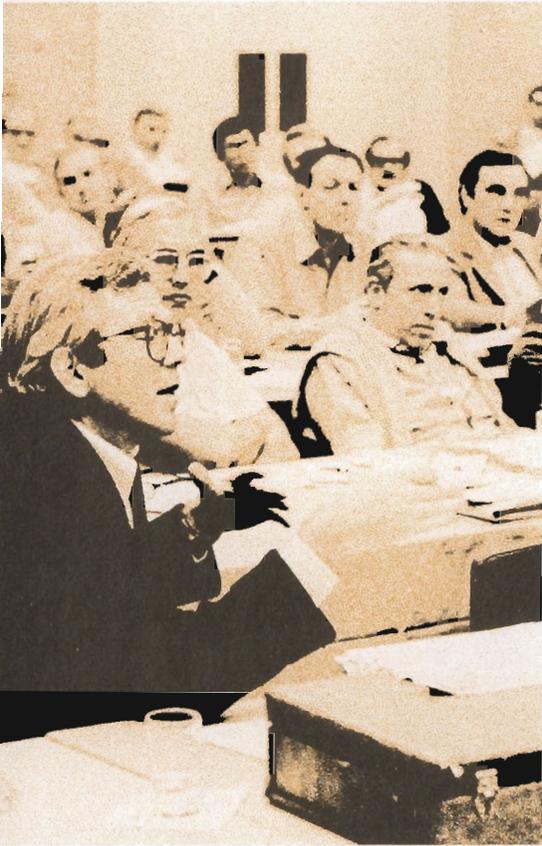
For the men and women of Hewlett-Packard Company/FEBRUARY 1980



HP OUTLOOK:
Business, people, energy

Fox Davis

Outlook for the '80s:



Cover: Results of a work-attitude survey of HP people are now being studied by the participating U.S. divisions and regions. A summary of the survey, known as Open Line, is presented on pages 7-10. It's part of an overall "outlook" report as we start a new decade.

□ *Winter storms pounded the California coast as HP managers from around the world convened at Pebble Beach in early January. Even more troublesome, perhaps, was the climate of uncertainty in world affairs. The Middle East was in turmoil. Detente with the Soviet Union seemed to have ended as surely and abruptly as the decade that nurtured it. A look ahead to the 1980s produced a mixture of gloom and optimism: a bright future for the electronics industry, but with a great deal of buffeting from external forces.*

Crisis and confrontation

Arriving at the Pebble Beach meeting directly following a White House briefing on world affairs, **Dave Packard**, chairman of the HP Board, spoke to the assembled managers about the serious confrontation developing in the Middle East. The events unfolding there were similar to those leading up to World War II, he warned, and President Carter was instituting economic sanctions against the Soviet Union.

The United States is no longer dealing from the position of military superiority it had at the time of the Cuban missile crisis, Dave said, and would need the help of its NATO allies to respond to a military threat in the Middle East. The administration had gained a better understanding of the Soviet Union's long-range goals, he reported, but the situation as it might affect the U.S., the business community, or Hewlett-Packard in particular, was uncertain at best.

The economics of change

Population changes will be a major driving force in the economy of the next two decades, according to **James Howell**, a distinguished professor of economics at Stanford University, who was a guest speaker at the Pebble Beach meeting.

Howell backed up his observations with research information from the Organization for Economic Cooperation and Development, or OECD.

World population now doubles every 35 years—although the rate of increase is slowing—and will grow from the present 4 billion to 5 billion in the 1980s. By the year 2000 there will be 6 billion people, and substantial shifts in the relative populations of the different regions of the world.

Changes will occur in age distribution as well, with some countries moving toward substantially older populations and some to much younger ones. To the extent that people's values change with age, so will the value systems of nations change. What Howell called "materialist" values, characterized by more conservative opinions in economics and politics, are generally held by older people. In conflict with many of those beliefs are the "post-materialist" values of younger people.

Labor shortages will occur in the '80s as population growth slows. Looking solely at these demographic trends, Howell also foresees changes in the political and industrial power of various world regions. Some industrialized countries, for lack of manpower to manufacture, will become exporters of capital rather than goods.

Population growth and changing values are two of the possible threats to economic progress in the next decade, but there are other related threats. Shortages of food, energy and raw materials were seen by Howell to be mostly social and political problems. There will be enough of every-

O.K.—if...

thing—or of acceptable substitutes—but governments and other human institutions will pose barriers.

There are no serious physical limitations, for instance, to producing enough food, but agricultural production doesn't match the distribution of population. So there will be food crises and starvation, but not because the Earth can't produce enough. In energy, too, there are adequate supplies to more than meet the demands of the next two decades. But it has, historically, taken 40 to 50 years to change over to new fuels, and the environmental constraints, wars, politics and even bad policy decisions will all contribute to energy problems in the '80s. The same can be said of some raw materials—particularly those that are concentrated in a few countries.

Technology will not fail us in the next two decades, according to Howell, except—again—where there are political obstacles. There will be no slowdown in innovation. Major areas of growth will be electronics, new forms of energy, exploitation of the oceans and new bio-industries.

The advanced industrial democracies will experience moderate rather than rapid growth, Howell predicted, gradually reducing their dominance in the world. But there will be no economic collapse or stagnation.

In the right business

In his report to HP managers on "issues of the '80s," President **John Young** foresaw "few surprises." The issues will not be esoteric ones, but areas that we can all work on today—and are already working on in most cases.

John began by reviewing each of the past four decades of HP's history, summarizing the company's growth in terms of people and products as well as sales and earnings. In the '70s, sales and earnings grew by more than seven times while the number of em-

ployees approximately tripled, resulting in a doubling of productivity. It was a decade in which HP built on the organizational structure established in the late '60s rather than radically changing it. It was also a decade which saw HP become a major computer company, doing 42 percent of its total business in computational products—as compared with 15 percent in 1969—while taking advantage of a renaissance in instrument opportunities.

John predicted the coming decade will be one of great instability, with the potential for wide economic swings. Inflation, energy shortages and capital scarcity are problems that may lead to lower growth and productivity. The baby boom has passed, which will result in fewer new entrants to the labor market and a drop in the ratio of workers to retirees.

Aside from the unfavorable demographic trends, the future of the electronics industry appears promising—"the only really bright spot around," as John put it. The '80s will be the "golden age" of electronics, he said, as large scale integration and other computer memory technologies continue to reduce the cost of computation. He also sees an erosion of the U.S. technological lead, however, and an increase in direct intervention and investment by foreign governments. Nevertheless, HP is in a good industry position as we begin the decade.

Specific issues, or challenges, to be dealt with during the next decade were spelled out in nine different areas ranging from IC strategy to concern for HP people. He emphasized the need to look closely at the corporate objective dealing with "fields of interest," with an eye toward being alert to new opportunities and achieving balance in the corporation. He reiterated the need to focus on cost and quality as competitive elements, the need to manage the company with regard to economics and politics, and

the need to develop effective control systems. Asset management is also a continuing problem that will require attention at all levels for the next few years.

Integrated circuit strategy is a "much-studied area," he said, but there's a general feeling that we're not getting what we should from our large investments. We need a broader look at our program for the years ahead. Some recent organizational moves in the Computer Groups and HP Labs facilitate a major study of IC operations, design tools and philosophies.

Marketing and distribution channels were discussed as well. No longer a simple matter of a field engineer selling the user on a one-to-one basis, today's complex products require a team effort. Computer stores, mail-order houses and third parties such as OEMs and software houses are also developing as new outlets for HP products.

In terms of organization, Young reminded HP managers that many forces run counter to the HP tradition of small, independent divisions. The need to cooperate and standardize in many different areas calls for some trade-offs, and the challenge is to keep a growing population of people working as a team.

HP people, John emphasized, were the chief concern of management when he joined the company 20 years ago, and they still are today. "Perhaps the surprising and encouraging thing is that we've done so well," he said, adding that HP managers will need to work harder just to stay even. New tools such as the Open Line survey are needed, and we should not lose sight of the old tools such as management-by-objectives.

We're in the right business for the '80s, Young concluded, and it should be an interesting decade.

(continued)

How we finished the '70s...

We can do better

To provide a vantage point for viewing the coming decade, HP's three executive vice presidents broadly described the "state of the company" as it ended the '70s—its fourth decade in business.

Dean Morton opened the discussion by sounding a theme that was to recur throughout the agenda: We had a good decade in the '70s and a fine 1979—but we could have done better, and we can do better in the future. He then reviewed some of the pluses and minuses that affected the company's performance:

- With sales substantially higher than targeted in 1979, we did not capitalize on the opportunity for extra profitability. In fact, the 1979 profit margin—profit as a percentage of sales—slipped below the target level. The damper in this situation: we spent more than planned in our production and operating activities.

- One obvious factor was the rising cost of purchased parts. We had no control over many of these increases, but in some cases we could have done a better job of anticipating our needs and thus have reduced the amount of premium prices paid to vendors and job contractors as we scrambled for materials during the latter part of the year.

- Another factor was the "October bulge," that mysterious ballooning of expenses as the company's fiscal year nears its end.

- Similarly, not much improvement was observable in the "end-of-the-month" shipment bulge except in a few divisions. The goal is to smooth out shipments, making them more "linear" because the month-end rush results in quality, distribution and work-flow problems that increase our costs and reduce profits. We need some fresh approaches in this area, Dean added.

- New products continued to provide a high proportion of HP sales. Products introduced in the last five years made up close to 80 percent of sales in 1979, with 1978 products particularly strong. We now have over 400 products that individually bring in one million dollars or more annually.

Ralph Lee suggested we can better assure our policy of self-financed growth by giving closer attention to two key areas: profit margins and asset management. These will become important themes in the '80s.

In the early '70s the challenge was to raise profit margins to their current range of 8 to 9 percent. Now we see opportunities to go beyond that range.

- Veteran employees will recall the big push in 1973 to reduce a general lag in "accounts receivable" payments. That paid off in 1974 and helped us ride out a difficult economic period in good shape. We need to maintain that vigilance, keeping receivables at 20 percent of sales or less.

- With one dollar tied up in inventories for every five dollars in sales (a ratio which has remained rather constant for the past three years), our management of inventories confronts us with some basic challenges. To improve this ratio we need to re-examine the way we do things, not only in the design and manufacture of products but also in how we demonstrate and deliver them to customers.

- We are seeing an increasing proportion of our assets—land, buildings, automobiles, demo and training facilities—being put to use in the field. Because of the dispersion this will be much harder to manage.

- Product quality has always been a strong suit for HP with its "traditional" customers. But the customer base has been changing since 1970, and the newer customers are less able to deal with defects and less tolerant

of problems. We can make a significant contribution to customer satisfaction and HP profitability by eliminating problems at the design stage.

Bob Boniface gave the field organization high marks for its over-quota 1979 performance.

Commenting on the pattern of over-quota performance, he noted there seems to be a tendency to fall off for short periods after years of over-quota effort. However, there appears to be no such letup so far in 1980.

- Service is becoming an increasingly important segment of field activity, and it enjoyed good growth in 1979 while keeping costs in line. We need to give more attention to profitability of service, particularly in the U.S. sales regions.

- What does it cost to support an HP field engineer? And what has been happening to sales performance per field engineer? Ten years ago, according to Bob, the cost of supporting an FE averaged \$56,000 in the U.S. By 1979 that had doubled—\$121,000. The average sales performance of U.S. FE's also had doubled, going from \$600,000 to \$1,200,000. Very large differences occur within those figures according to product group and geography.

Currently, the field organization is made up of almost 13,000 people, more than 24 percent of the company's worldwide employment versus 20 percent 10 years ago. To manage this organization as it grows even stronger, we need to put more emphasis on improving our field management systems—the targeting process, asset management and "admin."

Expect changes, challenges

Two general managers were asked to add their observations to the "where-we-are-today" discussion; giving particular emphasis to local organization experience:

Dick Hackborn of Disc Memory Division in Boise reviewed the impact of computers and computer technology, the company's rapid growth in size, and the challenge of maintaining management quality.

- As a particular benefit, the computer side of our business is growing at twice the rate of the rest of the company. Computer-related technologies are having significant and far-ranging effects on the entire organization. These include changes in the way many jobs are done, and large increases in productivity in a number of places such as manufacturing test and materials areas.

- The computer has brought us some major challenges, too, causing us to come up with new marketing strategies, bringing us into new markets, and confronting us with new and larger competitors.

- HP's instrument business has been strongly affected by the need to meet the new measurement requirements of computer technologies, and by the development of microprocessor-based measurement systems.

- Rapid growth is a challenge—but but we seem to be handling it well, said Dick. Productivity has continued to improve, and it has been shown that the HP way works just as well in the computer business as elsewhere in the company.

- In the '80s we can expect even more change than over the past decade. To handle it successfully we need to emphasize development of people, interdivisional communications, asset management, and the HP way.

Rick Weaver, Eastern Sales Region manager, discussed a number of problem areas including the need for a new method of reflecting long-range costs, such as buildings under construction in current targets. Under the present method, he said, there is a strong tendency within the organization to defer such costs until the coming year. The effect is to distort the intermediate-range plan.

- The major challenge continues to be that of working with people: recruiting them, providing an HP orientation, and maintaining a sense

of direction. We're working very hard in these areas and with a good deal of success. Our commitment to affirmative action will work so long as we stick to the HP way.

- The high cost of transferring people has created a new kind of problem. Do you organize the job around such persons in their present location? Or do you accept the high cost and move them where they will be most effective?

- Overall, the field is where the company all comes together in terms of costs. Fortunately, there is strong interaction between all areas of HP, and an awareness that we can solve many of our problems by emphasizing efficiency rather than just adding numbers of people.

(continued)



Strategies for the '80s...

Positioning our products

The strategies for HP's two major product areas in the '80s—instruments and computers—were outlined by their group managers.

Bill Terry, vice president and general manager of Instrument Group, noted that the strategic issues we face in the years ahead are not all new:

- Many of our well-known basic measurement product lines, for example, will continue to do well in the market place if we keep them fresh and fired up with new technology.

- We will continue to wrestle with the question of how best to manage and market automated measurement systems involving products from various divisions and groups.

There are a number of new areas for which decisions have been or will be made:

- We need a whole set of approaches and attitudes to better manage assets—especially inventories.

- We need to look hard at our fabrication strategy—and not necessarily copy our past model.

- We need to do a better job of managing the balance between profit and the other objectives in HP's instrument service activities.

- Training of field engineers has been good but decentralized and somewhat inefficient. A new measurement fundamentals program is being established in Palo Alto.

- Instrument manufacturing operations outside the U.S. are doing well both in proprietary and transferred product lines. We should be alert to opportunities for building markets through additional transfers, possibly to new international sites.

- We presently plan no new IC labs in Instrument divisions, and will meet growing needs through sharing and improved design technologies.

- Organizational changes are underway. Product specialization is growing in the technical sales forces. At the group level, new sub groups will be formed to reflect our varying customer strategies and technologies.

- To keep and add good Instrument people—and motivate them—we need to make sure that jobs are exciting and rewarding.

- In our present phase of growth at HP we need to guard against a bureaucratic tendency to emphasize the scorekeeping rather than the game itself. HP managers must focus on looking “outward” at customers, products and profits, and not “inward” at internal number crunching and excess information. Management is classically defined as “the art of getting things done through (not to) people.” Let's keep concentrating on quality in HP management, and good things are bound to follow.

Paul Ely, vice president—Computer Groups, reviewed trends that have occurred in HP's computer business since the almost simultaneous introduction of our first computers and desktop machines in 1967. Those lines have grown at a 30 percent rate since '69, and today—with combined sales of \$1 billion—sell in almost the same 3-to-1 ratio. Profitability stabilized during the second half of the decade.

Major changes have occurred along the way:

- HP-designed peripherals now contribute a third of our sales, and software takes an increasing portion of R&D investment.

- Computers and desktop calculators have gradually merged as a result of product strategies and market forces.

- Business computers, started in 1974, now represent about 40 percent of the total.

- Marketing and customer support have become increasingly important, requiring a very large and professional field organization.

- We now compete with a growing list of very competent firms in almost all phases of business.

Paul then identified four main challenges for the 1980s:

- Competition involving some of the best-managed companies in the world will continue to intensify. For long-term success we need to achieve leadership in a major sector of the market.

- We must become masters of IC technology to achieve high-volume, quality production, and we must also master the technology of mass memory, display and printing.

- Growth confronts us with challenges in obtaining and training good people, and with finding improved ways of managing a big business.

- Productivity is a challenge not only to HP but also to our society. Serving the productivity goals of our customers provides us with a major opportunity to achieve our leadership role. Internally, very large gains in productivity are possible by unlocking the potentials of people and asset management.

In meeting these challenges our basic strategy will be to:

- Do a few things well.

- Concentrate on interactive distributed systems.

- Focus on medium to large manufacturing companies as customers.

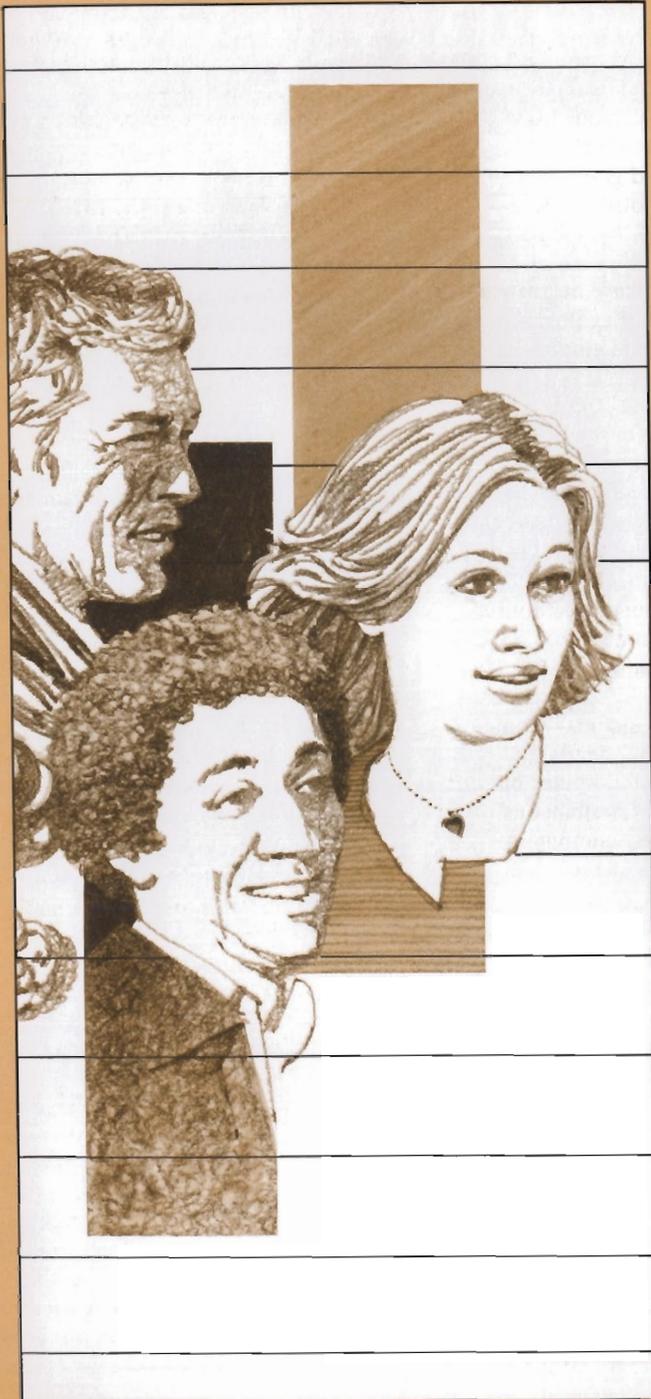
- Provide friendly systems.

- Give customers lasting value.

Paul touched on a wide range of specific actions that will be taken during the next five years as the company's computer business grows from a \$1-billion to a \$4-billion business.

(continued on page 11)

Open Line attitude survey: What? So what? Now what?



■ How do HP employees feel about the company, their jobs, fellow employees, supervisors and managers, their pay and benefits and many other job-related items? Those are some of the employee attitudes now being studied as a result of the Open Line survey conducted last September in the U.S. organizations.

John Doyle, vice president-Personnel, offered a summary and evaluation of the overall results of Open Line to the general managers who met in Monterey last month. In handing out division and region reports, he outlined the all-important program of local analysis, feedback and action that will take place during the coming months.

The special report in this issue of MEASURE reviews the scope and intent of the survey, discusses highlights of the findings, presents a factual summary of overall results and outlines the activities to follow.

What?

Open Line had several major objectives. One was to give employees a chance to express views about the workplace. Another was for the company to listen carefully to those views and to provide people with the opportunity to do something about the ideas and concerns that arose. A third was to learn how we compare with other large companies in employee attitudes. A fourth was to set a "benchmark" or standard for future surveys. A fifth was to view it as a test for possible surveying in other parts of the HP world.

Conducted for HP by International Survey Research of Chicago, Open Line asked 7,966 employees a total of 115 general questions plus some supplemental questions for R&D, marketing, management and field sales people. Participants were randomly selected through the use of three digits in the employee numbers. All U.S. organizations were represented by at least 11 percent of their employee population, while six divisions and one region were sampled an extra 39 percent (50 percent total) as a way of testing the validity of the smaller samples. Anonymity of responses was guaranteed.

(continued)

Open Line

In summarizing the results, ISR grouped responses to the 115 questions into 17 categories for comparison with national "norms" derived from recent ISR surveys of 200 top companies. HP scored significantly above those norms in all but one category, accumulating a total of 197 percentage points above the norm. That figure serves as a rough "yardstick" against which local totals can be compared, but it does not begin to tell a complete and accurate picture.

So what?

From their responses to questions about personal identification with the company, it's clear that HP people like working for HP. Some 93 percent said they would recommend HP as a place to work, and 83 percent actually said they feel personally responsible for contributing their share to HP's success. Overall, their identification with the company was 25 percent above the national norm—a figure that the survey specialists saw as extraordinarily rare and even "mind boggling."

HP people also liked the survey itself as a way of communicating their views—as do most people surveyed. But in the HP case, peoples' belief that management will listen, communicate results and act if necessary was far above the norm.

That attitude was strongly mirrored in the other responses concerning HP management: Is it effective? Is it concerned for employee welfare? Is it credible? Does it understand the problems of employees? Overall, people said "yes" by a 21 percent margin over the mean. Yet, even here, room for improvement was clearly indicated by the 33 percent who gave an unfavorable response to the last question.

In fact, according to John, there seem to be plenty of areas for attention.

One in particular stems from the responses to questions about job stability. In this category, people expressed greater concern than the national norm about HP's high growth rate, reorganizations, and what the future holds for their organization. This earned HP its one below-norm rating, and created something of a surprise for a company that puts such emphasis on employment security. While it may be possible to translate "concerned" as "interested in," John feels there is a degree of anxiety expressed in this response that needs to be explored in the local analysis sessions.

- An interesting difference arose between two questions relating to the open door policy. One question asked whether "I feel free to make use of the Open Door policy." The response to this was 73 percent favorable and 6 percent unfavorable. The other question asked "If I am dissatisfied

with my supervisor's decision on an important matter, I feel free to go to someone higher in authority?" The response here, while well above the national norm, netted a 60 percent "yes" to 30 percent "no." Somewhere between those two sets of responses there would seem to be some misunderstanding of the meaning and intent of the open door policy. The two should have been closer, although of course the open door can and should be used for more communication than just complaints.

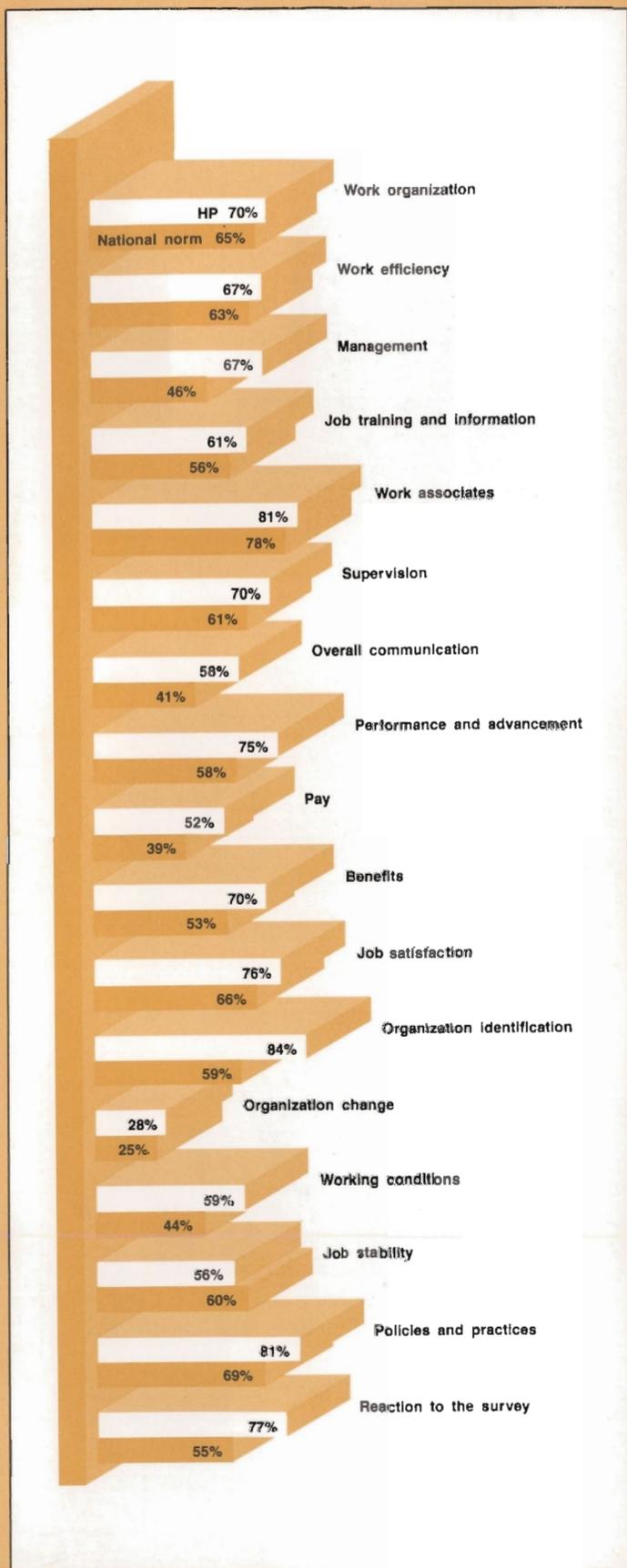
- Not many people were unfavorable toward the corporate objectives. However, when the 80 percent who said they understood the objectives were asked whether they agreed with them, one in five had no opinion. Again, asked if they think the objectives are pursued in their organization, there was a substantial "don't know." Altogether, those results suggest an opportunity to improve awareness and application of the objectives.

- Although supervisors are good one-to-one communicators and quite helpful in solving problems, HP people rate them less favorably in building teamwork, recognizing performance and providing regular feedback.

Now what?

The many areas surveyed will provide numerous opportunities for analysis, comment, comparison and action both at the division/region level as well as corporate. It's expected that most of the analysis and the actions taken will occur at the local level in response to local results. Analysis groups of ten or a dozen people headed by specially trained leaders and representing various departments will review certain areas of interest, identify things to do and recommend actions to be taken. In turn, Corporate Personnel will be kept informed of all recommendations, insights and actions taken. It will also initiate whatever actions need to be taken at the corporate level. A comprehensive report of Open Line activity will be made available to employees at year's end.

As mentioned at its announcement, Open Line should not be viewed as a substitute for the all-important face-to-face communication that should occur between people and their supervisors. Instead, by providing factual information on how HP people view their jobs and roles, greater opportunities are available for improved communication and understanding.



Last September nearly 8,000 employees spent about 45 minutes answering 115 questions that ranged from “How important is a supervisor’s recommendation in getting a promotion in HP?” to “Do you think your job is considered important in your division/region?” The 115 questions fell into 17 categories which are described below and are illustrated in the graph to the left. In all cases, the percentage (shown in white) of favorable responses from HP employees is compared with the comparable figure from the national sample (in gold) of 200 top U.S. companies.

- **Work organization**—Do HP employees feel the work is distributed fairly in the work group? Do they understand how their jobs fit into other work done in the division or region?

- **Work efficiency**—Is quality work being done with little or no wasted time? Does work flow smoothly and quickly?

- **Management**—Are management decisions fair? Are members of HP management team concerned about the welfare of employees? HP’s high score of 67 percent favorable responses (compared to a national norm of 46) was called a “once in a decade” occurrence by the survey consultants.

- **Job training and information**—Does the company do a good job of preparing new employees for their positions? Are HP training courses useful in improving job performance?

- **Work associates**—Do employees work well together? Is there a friendly atmosphere that makes new employees feel welcome? More than 80 percent of those surveyed feel good about their co-workers.

- **Supervision**—Do supervisors give credit to employees for a job well done? Do supervisors help solve problems when they occur?

- **Overall communication**—HP employees rated the company’s communication well above the national norm of 41 percent. The survey showed employees feel the company keeps them informed of matters that affect them, and managers are receptive to employee opinion.

- **Performance and advancement**—Do most employees understand the criteria used for performance evaluation? Are the evaluations fair? Does Hewlett-Packard promote competent people from within the organization?

- **Pay**—Do salaries match or beat those in the industry or the region? Is the HP salary system adequately explained to employees?

- **Benefits**—Do HP benefits fit employees’ needs and are they updated on a regular basis? How do the benefits compare with other companies? Benefits were rated favorably by 70 percent of HP employees, 17 percent above the national average.

(continued)

Open Line

- **Job satisfaction**—More than three-fourths of the HP employees who participated in the survey responded favorably in the job satisfaction category. They found their jobs interesting and satisfying and felt those jobs have an important role in the company.

- **Organization identification**—There were more favorable responses from HP employees in this category than in any other. As a result, HP beat the national norm by 25 percent. Employees answered “yes” to questions like “Would you recommend the company as a good place to work?” and “Is the company concerned about its employees?”

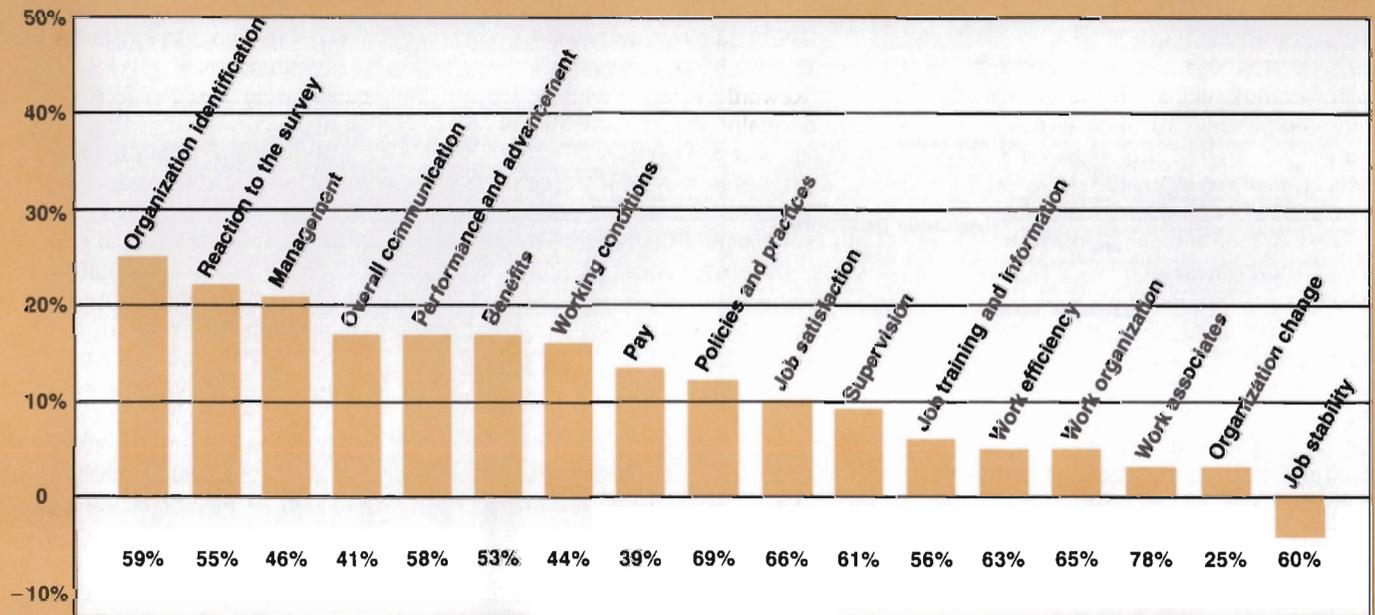
- **Organization change**—Do employees feel the company has changed for the better, the worse, or stayed the same in the recent past? Has change had a positive or negative effect on morale, communication, policies, etc.?

- **Working conditions**—Are safety, work space, working hours, cleanliness and the like better at HP than elsewhere?

- **Job stability**—This was the only category where HP employees responded less favorably than the national average, although the difference was just four percentage points. Results indicate that HP employees are more concerned with reorganizations, relocations and closing of facilities than the average worker. Perhaps in part this is good because HP people should be concerned about their company and their own futures. But insofar as this answer conveys worry, we need to address and alleviate it to the best of our ability.

- **Policies and practices**—Do HP employees receive adequate information about personnel policies and procedures? Do rules and regulations usually make sense to employees? More than 80 percent of the employees said “yes” to questions in this category.

- **Reaction to the survey**—More than three-fourths of the employees who were surveyed felt the survey was a good way to “tell management what I think.” And employees had very high expectations that company management will consider problems, act on them and communicate those decisions to employees. □



The 17 general categories of HP's Open Line results are shown in their order of ranking in percentage points above or below the national norms. In this Delta profile, the first eight categories (from Organization Identification through Pay) show HP margins that are significantly above relatively low norms. In this series, HP averages 18.5 percent above a 49.4 percent norm average. In the next seven categories (Policies through Associates), HP's margins are only moderately above rather high norms. Here, HP averages 7.1 percent above an average norm of 65.4 percent. Actually, in total favorable responses, the HP averages in both of these two series were at a very similar high level—68.9 percent average for the first, and 72.5 percent for the second. The last two categories show a different picture: In Organization Change we are only 3 percent above a very low norm of 25, and in Job Stability we fell some 4 percent below a 60 percent norm.

Problems and opportunities...

Raise your expectations

A panel of HP manufacturing people urged the assembled managers to raise their expectations dramatically for significant improvements in product quality and productivity during the years ahead—and presented some reasons for doing so.

Three of the panel members—Ray Deméré, vice president-Manufacturing Services, and manufacturing managers Gaylon Larson (Data Systems), and Dar Howard (Colorado Springs)—had recently returned from a tour of various Japanese manufacturing plants. Fourth panelist was Doug Spreng (Disc Memory).

The Japanese industrial revolution, they said, represents a complete change in thinking about production. Traditionally, higher quality has meant higher cost, and larger lot quantities lead to lower cost. Japanese manufacturers such as Toyota, Matsushita, Sharp, and NEC have turned that around: high quality lowers the costs of goods, and small lots can be produced at lower cost.

This is done through a combination of approaches, all dependent on low defect rates. One is to work off of very low inventories, everything moving continuously on a “just-in-time” basis. Implied here are strong ties between departments extending all the way back to outside suppliers, and a quality system based on never passing problems on to the next person or department.

“Quality circles”, known also in HP as quality teams, are highly organized and motivated to achieve zero defects and low cost at every step of the production process.

Automation is another key approach to quality. Japanese manufacturers invest heavily in automated

processes for the sake of quality which also resulted in improved productivity. Their success is astounding: defect rates as low as one per million parts, versus U.S. rates of one per thousand or worse.

“They are orders of magnitude ahead of what the rest of the world is used to”, said Deméré. Then he asked “Can we do it too?” The panel strongly believed we could, and offered a quick-action plan for a start:

- Make quality a specific corporate objective.
- Raise quality expectations.
- Eliminate all possible defects at the design stage (versus reworking and fixing).
- Upgrade the materials function.
- Forge strong working partnerships with vendors.
- Build quality teams (and keep them involved and motivated).
- Reward success—with recognition for quality teams and with competitions between divisions.

Doing all of these things and more, making quality a way of manufacturing, will bring about great improvements not only in product quality and productivity but also asset management, reduced warranty costs and increased customer satisfaction.

Put more R in R&D?

Barney Oliver, vice president R&D, described the changing role of HP Labs, and invited the managers to contribute their ideas for its future.

Many changes are apparent over the '70s. At the beginning of the decade Labs was in one building, much of its attention focused on LSI (large-scale integration of integrated circuits). By the end of the decade, microprocessor technology had become important to a large and growing number

of our products, and Labs itself had grown to three centers made up of eight labs occupying five buildings.

In the '80s the shift in product technology will be to VLSI (very large-scale integration), with a ten-fold increase in complexity of circuits that will propel us into new and expanded markets.

Barney outlined a series of Labs' strategies for complementing the development efforts of the product divisions:

- Support research having multi-divisional use.
- Develop new types of products as the basis for forming new divisions.
- Help particular divisions that need Labs support or where Labs has a good idea to contribute.
- Leapfrog the development efforts of divisions in existing lines.
- Provide new devices in modest quantities as well as specific services on request.

Barney also stated a series of internal and external goals—all of which he hoped would help make the cost for HP Labs seem a small price to pay.

Finally, how should Labs divide its efforts between advanced research and product development? Barney posed that question to the managers, expressing the belief that we can now attempt more research in selected areas. In doing so we should seek new principles and knowledge that would contribute to the advancement of the company and the scientific community.

(continued)

problems and opportunities...

Comeback at Corvallis

Dick Moore, general manager of Corvallis Division, described how unexpected and highly technical problems affected volume production of integrated circuits in mid-1979, seriously curtailing planned shipments of two major new handheld products. He went on to outline the measures that were taken to overcome the problems and put the division in position for an excellent 1980.

On the upside, according to Dick, the CMOS integrated-circuit process developed at Corvallis is "second to none" in the U.S.—a "vision that paid off." In the field, the consumer-products sales force has proven itself able to move products onto the market fast with very short notice. Contrary to some outside evaluations, the product line's overall position is much less vulnerable to the kind of competitive onslaught that hit the HP-35 some five years ago.

Some on-going studies

Three special reports were given to the meeting as a result of task-force activities and studies made since the previous meeting.

John Blokker, general manager of Santa Clara Division and chairman of the new-buildings task force, reported development of a set of objectives for our building program. It incorporates standards for new manufacturing buildings, and criteria for site planning and cost control.

John noted that our new sites now are generally larger than in the past, and we are doing more advance planning in their development.

Bill Parzybok, general manager of Loveland Instrument Division and head of the company's factory-inventory task force, described the opportunities for improving our management of inventories as "very large."

Bill noted that 25 percent of all our assets, both manufacturing and field, are tied up in inventories. A survey revealed that these can be significantly reduced, and there is growing enthusiasm to do so.

Several divisions are showing the way, Bill said, and have lowered their inventories to below three months supply. But much more can be done.

Recommendations include using quality as a lever to reduce inventories, strengthening relationships with vendors, improving our information systems, simplifying the manufacturing processes, and sharing more ideas. The task force will shortly issue a book that brings together a variety of inventory-management ideas and experiences.

Carl Cottrell, Corporate Marketing Operations manager, reported a sharp percentage increase in field assets (other than receivables which remain fairly constant).

Buildings are becoming larger and more complex because of the need for product demonstration and customer-training centers. Other categories including consignment inventory, automobile fleet, machinery and equipment, and service parts, are also growing fast.

Many groups in the field as well as in corporate organizations are working on detailed studies of the use of assets. Improvements will come about mainly through extra attention to detail and to planning, and making assets more visible in our control systems.

Controlling the system

With the prospect of some 200 profit centers to manage by the end of the '80s, we need to give lots of attention to our control system, making it more useful, less time consuming and easier to use. President **John Young** made that point, adding that the system of the future must be able to accommodate growth but not overpower the management style that fits our company.

What is a "control system"? Basically, it's the system we use to establish goals and plans, and to report and measure performance in a timely and effective way. It takes the form of targets and intermediate-range plans (IRPs), as well as other informational tools.

While that system has proven very adaptable to changing requirements over the years, the blizzard of numbers grows, and we need to make a number of specific improvements. A more efficient and helpful control system will give us more time for the tasks relating to products, markets and customers that add real value to the organization.

International factors

Strategies with regard to international manufacturing facilities and tax planning were outlined by Bill Doolittle, vice president-International, and Larry Langdon, Corporate tax manager.

Bill Doolittle reported that a recently completed study identified a significant difference between the manufacturing activities of the measurement products and those of the computation line. In the case of measurement products, the total number of products produced is voluminous, but each is produced in relatively small volume. Computation products,



on the other hand, are much fewer in number but are produced in large volume.

The study also identified three types of facilities now in use—standard product-line divisions, systems integration centers, and fabrication facilities that support various integration centers.

Larry Langdon emphasized the value of worldwide tax planning as a means of enhancing our ability to self-finance growth, and of avoiding costly surprises. Changes in tax legislation over the next few years could have a major impact on HP. □

But will we have the energy?



John M. Deutch

□ It was an easy matter this year to choose the topic of discussion for Hewlett-Packard's fourth annual legislative briefing:

Energy in the 1980s.

As Government Relations director Jack Beckett told HP general managers gathered at Palo Alto headquarters on January 3, "Energy seemed to pose the greatest concern in planning for our company's future. Energy is especially important to Hewlett-Packard because growth industries are the most threatened by energy shortages.

"The energy policies that the Carter Administration is presenting to the country are basically correct but the rate at which we are implementing them is incredibly slow given the nature of the problem."

**Undersecretary John M. Deutch
U.S. Department of Energy**

Inadequate energy affects our own manufacturing processes, our customers' use of HP products, our employees' ability to get to their jobs, and the location of new plant sites."

The scope of HP's legislative briefings has broadened from the first

meeting four years ago which dealt strictly with California issues to this year's session on an issue with international implications as well as an impact on government action at federal, state and local levels.

This year's speakers included Senator Henry M. Jackson; Undersecretary John M. Deutch of the U.S. Department of Energy; Congressman Norman Y. Mineta; and Professor Henry Rowen of the Graduate School of Business at Stanford University and former president of the Rand Corporation, as well as spokesmen for the California state legislature, California state commissions on public utilities and energy, and the local Bay Area transportation authority.

The day's headlines on Iran and Afghanistan underscored Professor Rowen's warning on the danger to the U.S. and its principal allies of continued dependency on Persian Gulf oil for a significant amount of their energy.

"The security of the supply of this oil is truly in jeopardy," declared Rowen, predicting that by the end of the 1980s or even sooner the Soviet Union will have control over much of the Persian Gulf oil and influence the terms on which it is made available. Coupled to security is another central energy problem of the 1980s, the enormous transfer of wealth from oil-importing to oil-exporting countries.

Great economic damage results from sudden interruptions in supply—either deliberate on the part of producers or due to internal chaos in an oil-producing country—which increase sharply the real price of oil.

On the supply side of the equation, Rowen thinks, "We probably can't do much to increase supplies that will have a major impact by 1990." He

"It is a really worrisome thing that the U.S. and its principal allies, Japan and Europe, continue to be dependent for oil on an unstable Persian Gulf area into which the Russians are moving."

**Professor Henry Rowen
International Energy Program
Stanford Graduate School
of Business**

added that any other sources for oil or alternate types of energy that are developed will help in the aggregate, of course.

"Energy is really not like every other commodity," according to Undersecretary Deutch. "Because of the international circumstances, energy has become key to the economic strength and well-being and the



Henry M. Jackson



Henry Rowen



Norman Y. Mineta

growth of our country and our allies. That makes it a matter of substantial concern."

If the supply side looks gloomy, both experts see little reason for optimism on the demand side of the picture. They agree that the availability and cost of oil will contribute to a rather flat economy in the U.S. during the next decade with the real growth rate held to a modest 2½ to 3 percent. Government projections for 1990 have changed quite dramatically in the past year to reflect the greater price of oil and a corresponding lessening in anticipated growth rate.

Deutch frankly admitted his own pessimism: "It would be difficult to find anybody who has a bleaker point of view on the outlook for energy in this nation than I do.

"In my opinion," the Department of Energy official said, "the Carter Administration policies are right but the rate at which we're implementing them in all sectors is incredibly too slow for the nature of the problem."

He outlined the major points of Administration energy policy as decontrol of oil and gas prices to moderate the demand for energy (but coupled with low-income assistance); trying to increase conventional oil and gas sources; energy conservation and energy productivity; increased utilization of coal; renewable energy

"The international community looks upon the U.S. as a gluttonous consumer of energy. We keep the demand for oil so high that we become OPEC's best friend."

Congressman Norman Y. Mineta (Democrat—California)

sources such as biomass, passive solar construction, solar hot water heating, hydro and geothermal; preserving the nuclear option, and improved emergency planning for supply interruptions such as stocking the Strategic Petroleum Reserve.

Conservation is seen as the fastest, quickest and most cost-effective way to save energy. As Professor Rowen put it, "The American people are energy hogs," using far more energy per capita than Europe or Japan.

The intricate legislative process through which energy policy must be translated into law was discussed by Senator Jackson, chairman of the Senate Energy and Natural Resources Committee, and Congressman Mineta, a member of the House Public Works and Transportation committee which is one of a number of House committees dealing with various aspects of energy. (Passage of energy legislation

in that body must be sifted through 26 sub-committees.)

Congress has passed or is about to pass a number of critical bills to encourage conservation and speed the development of new energy supplies. Phased decontrol of crude oil began on January 1, with price controls on gasoline due for removal in September, 1981. An Energy Mobilization Board has been created to cut red tape for starting such non-nuclear projects as pipe lines, refineries and synthetic fuel plants.

Both legislators are supporters of nuclear energy, which is controversial in the Congress.

"The international situation, which is going to bring home energy shortages and prices, will be the strongest political force for action in this country. That's the way the system works."

Senator Henry M. Jackson (Democrat—Washington)

"I feel very strongly that we can't afford to be dependent upon any single source of energy any more than we can exclude any single source of energy," said Mineta, who was impressed with energy facilities he saw

(continued)

...energy

(continued from page 15)

in England, France and Germany. He sees as vital the transition from an oil-based economy in the U.S. to one based on diverse sources of energy.

Senator Jackson summed up the view of all the speakers on the international and federal aspects of the energy issue:

“How we manage our foreign policy over the next 10 to 15 years will determine the availability and reliability of the supply and the price of oil. We will be doing an outstanding job domestically if we are able to stay where we are now in terms of supply—we will have to run hard with all these programs just to stand still.” □



“We need a strong educational program from the Department of Energy on nuclear energy. For 20 or 30 years the media have been associating nuclear with bombs. As Petr Beckmann says, that’s like associating electricity with chair.”

**Barney Oliver
Vice-president, R & D
Hewlett-Packard**

Measure

EDITOR
Gordon Brown

ASSOCIATE EDITORS
Dennis Cresswell
Betty Gerard

ART DIRECTOR
Tom Martin

GRAPHIC ASSISTANT
Sue Perez



1501 Page Mill Road,
Palo Alto, California 94304

MEASURE Correspondents—ANDOVER, Frank Orlandella • AUSTRALASIA, Geoff Windsor • AVONDALE, Peter Ward • BOISE, Mark McDonagh • BRAZIL, Campinas, Jose Lacerda • COLORADO SPRINGS, Betty Lofton • COMPUTER SUPPORT, George Lewis • CORVALLIS, Dick Anderson • DATA SYSTEMS, Steve Strain • DATA TERMINALS, Polly Johnson • DELCON/CSC, Ed Igen • DISC MEMORY, Don Harris • EASTERN SALES, Vince Macrina • FORT COLLINS, Pete Peterson • GENERAL SYSTEMS, Ken Coleman • HP CANADA, Brian Wright • HP FRANCE, Jacques Marquizeau • HP GmbH, Ernst von Glasow • HP ITALY, Alice Pantera • HP SINGAPORE, Charlie Marshall • HPSA, Bob Posey • INTERCON, Judy Hansen • LOVELAND, Jackie Peake • MALAYSIA, Maria Malik • MANUFACTURING, Shirley Gilbert • McMINNVILLE, Chuck Walker • MIDWEST SALES, Jessica Tollman • MSD, Shirley Gilbert • NEELY SALES, Roseanne Peters • NEW JERSEY, Bob Muggleston • OED, Gary Ruppel • SAN DIEGO, Tamara Jaynes • SANTA CLARA, Bill Higgins • SANTA ROSA, Dave Curry • SCIENTIFIC INSTRUMENTS, Keith Elledge • SOUTH AFRICA, David Booker • SOUTHERN SALES, Edith Varnell • STANFORD PARK, Joe Shep • UNITED KINGDOM, David Reed • WALTHAM, Janet Dale • YHP, Misako Harada

HEWLETT-PACKARD COMPANY
1501 Page Mill Road
Palo Alto, California 94304

BULK RATE
U.S. POSTAGE
PAID
SUNNYVALE, CALIF.
PERMIT #741

47-14293
KENNETH L MACY
403 MEADOW DRIVE
BOULDER CREEK, CA. 95006