

Labor Occupational Health Program MONITOR



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In This Issue:

- HAZARDS OF NEW TECHNOLOGY
- ELECTRONIC MONITORING IN THE WORKPLACE



Labor Occupational Health Program MONITOR

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On the Cover:

This issue of Monitor highlights the workplace of the 1980s. Today, millions of workers in both offices and industry routinely use computers, lasers, robots, and other "high tech" equipment on the job. Work has been transformed in dramatic ways.

From supermarket scanning equipment to word processors to the new industry of silicon chip manufacturing, "high tech" is here to stay. But many of the articles in this issue suggest that this technological revolution, if implemented without safeguards, can be a threat to both the psychological and physical well-being of workers. The new workplace presents a host of new occupational hazards: fear of job loss, increased job stress, eye and muscle disorders, exotic new chemicals. Our authors look at the problems and suggest some possible solutions.

Also in this issue: Video Views, LOHP's formerly separate newsletter on the hazards of video display terminals and computers, will now be combined with Monitor on a regular basis, beginning with this issue. On page 8, our first Video Views section investigates electronic monitoring, a new means of supervising and controlling workers which 1980s technology has made possible.

Cover photo: The automated teller machine at the local bank is one symbol of the "high tech" revolution. (Photo copyright (c) Ken Light.)

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LOHP is a labor education project affiliated with the Center for Labor Research and Education at the Institute of Industrial Relations. We produce a variety of printed and audiovisual materials on occupational health, and conduct workshops, conferences, and training sessions for California workers and unions. A catalog of materials and a brochure which describes training services are available upon request.

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Proposition 97 Passes

California Voters Restore Cal/OSHA

Labor and allied groups scored a major victory in the November 8, 1988 election, as California voters approved a ballot proposal to restore Cal/OSHA, the state's job safety and health agency.

Final returns showed the measure, Proposition 97, winning with over 53 percent of the statewide vote.

Governor George Deukmejian (R.) virtually eliminated the 13-year-old Cal/OSHA program in mid-1987 when he cut most of the agency's funding and transferred its private sector enforcement responsibilities to federal OSHA. Since that time, a vastly reduced Cal/OSHA program has had jurisdiction only over public employees.

Proposition 97 was placed on the ballot as the result of a grassroots petition drive. The campaign this fall to pass the proposition was led by the state AFL-CIO and actively supported by the American Cancer Society, American Lung Association, League of Women Voters, Consumer Federation of California, Sierra Club, American Industrial Hygiene Association, and many other environmental, health, consumer, law enforcement, and attorneys' organizations. Numerous city councils and county boards of supervisors throughout the state endorsed the measure, as did several business groups.

Proposition 97 supporters argued that federal OSHA has weaker and less effective

standards and enforcement than Cal/OSHA and that California job accident rates have risen since the Cal/OSHA private sector program was eliminated. Supporters also pointed to recently released figures from State Controller Gray Davis which refute claims that the Cal/OSHA curtailment saved the state money. Because revenue from fines and federal matching funds was lost, Davis said, the curtailment actually resulted in a net cost to the state of over \$1 million.

Observers are uncertain when and how Deukmejian will now restore funds for Cal/OSHA.

A New Way of Life, New Threats to Health

by **Mychelle Balthazard**
and **Anne Gordon**

Mychelle Balthazard and Anne Gordon are members of the Video Display Terminal (VDT) Coalition, a Northern California group of unions and individuals concerned with new technology in the workplace. The Coalition is based at LOHP.

For most of us, the mention of "new technology" brings to mind vague, intangible, and futuristic images.

But the future is here. Think about it: There are word processors and video display terminals (VDTs) on the desktops in many of our homes, classrooms, and offices. Retail stores track the entire flow of their inventory on complex computerized systems. Canned sodas and boxed cereal are now checked out at the grocery store by a laser beam reading a series of mysterious vertical black lines. Many of us have not seen the inside of our bank for years because we now conduct all financial transactions through an automated teller machine. And these are only a few examples of how new technology shapes our way of life. Behind the scenes, robots and computers now play key roles in manufacturing and distribution as well as in the service sector of the economy.

This new way of life is here to stay. It has been estimated that five years ago, approximately \$210 million per year was being spent on non-military laser systems. In 1987, those estimates surged toward \$665 million. By the mid-1990s, it is expected that \$1.6 billion per year will be spent.

Other figures are equally dramatic. It is clear that VDT use is on the rise. In 1985, 14% of all U.S. jobs (or 15 million) involved VDTs. This figure is expected to increase to 75% by the end of the century. And in another sphere of work, it has been reported that by the end of this decade four to seven percent of all U.S. factory jobs could be performed by robots.

New technology surely makes our lives as consumers easier. But what implications does it have for us as members of the workforce?



Electronic equipment is everywhere in today's office. (Photo copyright © Ken Light.)

There are many answers to this question. Employers claim that new technology eliminates the "dog work" (the boring, dirty, and dangerous jobs) and is thus a service and a favor to workers. But workers and unions may have a different perspective. New technology often means bad news for workers: loss of jobs, less control over the work process, less interesting work. The net result is a growing gap between high-paying jobs that require a great deal of skill and technical knowledge, and low-paying ones that require little skill and are repetitive and boring.

JOB DISPLACEMENT

Job displacement or job loss is a major consequence of new technology. One manager in the auto industry has predicted that by the year 2000, the industry will have replaced 40,000 human jobs with 20,000 robots. Each robot is capable of doing two

human jobs. It doesn't take an economist to understand how devastating that could be to both the regional and national economies. And that is the estimate for only one industry. If other industries follow suit, many thousands of skilled workers will be handed their severance pay.

DE-SKILLING

De-skilling means that a worker's job is less complex and requires less independent judgment than before. It means that the job takes little knowledge or thought. An example is the worker who uses a computerized cash register. In the past, retail clerks were required to know the prices of various items. They had to be able to punch in prices accurately, and calculate the correct change. With the new Universal Product Code (UPC) systems—the coded black vertical lines that appear

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This is the first of two special issues of MONITOR on new technology and its effects. The next issue (Fall, 1988) will feature carpal tunnel syndrome, a wrist disorder increasingly common in the modern workplace, and "home-work," a new international trend encouraged by 1980s technology, which many see as a throwback to the worker exploitation of the nineteenth century.

NEW WAY OF LIFE

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on most retail items—all the clerk has to do is to pass the product over a laser scanning device, take the customer's money, and return the change that has been calculated by the system. Because the labor involved is considered less demanding, employers believe that the clerk's job is worth less pay. Wage scales are dropping in many service sector industries as a result of the new technology invasion.

MONITORING

Monitoring is another by-product of new technology. It allows management to use computerized methods to check, supervise, and control each worker's output. In typical setups, every worker is linked to an electronic system which tracks work pace, number of mistakes, and amount of rest time. Many who have had their work monitored claim that the process demolishes any sense of trust between the worker and the supervisor; workers constantly face reprimand if they don't perform quickly or accurately enough. Employees have been demoted or dismissed when they failed to meet the criteria established for acceptable performance. (See article, page 8.)

STRESS

Any of the situations described earlier (job displacement, de-skilling, or monitoring) could easily erode one's general physical and mental well-being. And in fact, several specific adverse health consequences have been associated with the introduction of new technology into the workplace. A major consequence is increased occupational stress. Many workers facing the changes resulting from new technology claim to experience more fatigue, headaches, and insomnia. These usually first appear as short-term, acute symptoms. Often, however, they become an indication of something more chronic and more serious, such as hypertension, coronary heart disease, depression, or nervous breakdown.

OTHER HEALTH EFFECTS

Stress is only one example of the toll new technology can take on workers' health. Workers also face difficulties resulting from poor equipment design. VDT operators often sit at work stations where the desk is at an inappropriate height, the keyboard cannot be moved to a comfortable position, the chair is uncomfortable, and the overhead lighting creates

excess glare. VDT operators once applauded the invention of the word processor; today many are more concerned with the eyestrain, headaches, shoulder pains, arm and wrist problems, and backaches they have every day after work.

Another example of poor equipment design is seen in the introduction of computer numerical controlled (CNC) machine tools in the aerospace industry. This new machinery operates at much higher speeds than the traditional machinery and thus at increased, hazardous noise levels as well. In a shop where noise levels are already high, these new innovations only aggravate the problem.

With the increased use of high-speed electronic cash registers and laser scanners in stores, retail clerks report extreme fatigue from the faster pace. Many develop carpal tunnel syndrome, a wrist disease linked to jobs requiring rapid,

repetitive motions. Carpal tunnel currently represents more than one-fourth of all occupational illnesses and is raising questions about the design of the workplace and the work task.

WORKER INVOLVEMENT

Because these technologies are so new, workers and unions often lack the information they need to prevent the problems discussed here. Workers need information in advance about what changes are planned and what their economic and health implications may be. Only then can workers and unions intervene early enough to ensure that new technology is a benefit, rather than a problem, for working people.

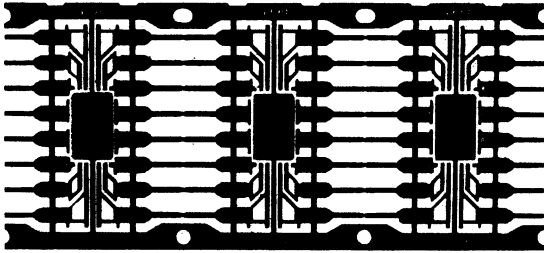
(Some steps that can be taken are discussed in many of the following articles.)



The laser scanner at the supermarket may make the store more efficient, but it can also contribute to the "de-skilling" of workers and monitor their speed. Moreover, the faster pace required can contribute to wrist disorders. (Photo copyright © Ken Light.)

New Technology and the Work Environment: Problems and Solutions

by Steven Deutsch



Editor's Note: Steven Deutsch is affiliated with the Center for the Study of Work, Economy and Community at the University of Oregon in Eugene. Here, he surveys trends in the economy and the workforce which have accompanied the explosion of new technology in the 1980s, and reviews recent responses to the new health and safety questions both in the U.S. and abroad. The article was adapted by the author from his presentation at a Northern California Occupational Health Center seminar in April, 1988. See the accompanying bibliography on page 7 for sources mentioned in the text and other important material on new technology issues.

WORK IN THE '80S

Two dramatic factors have altered the economic and work picture in the United States in recent years. First is the globalization of the economy, involving the export of jobs and production offshore and the new international competition of goods. Second is the application of microelectronics or "new technology" in the work setting.

As a result of these and other developments, we have seen in the 1980s major shifts in the occupational structure (what kinds of work Americans do) and in the composition of the workforce. Understanding this reality is critical if we are to address issues of bettering the work environment and working conditions in the years to come.

Some of the shifts have produced massive dislocation. In the first years of the 1980s more than ten million U.S. workers lost their jobs. Entire industries such as steel, auto, and forest products experienced structural, industry-wide changes which permanently altered the employment patterns. For those workers who were re-employed, more than half were working at lesser-paid jobs. While the U.S. economy has added 20 million new jobs in the past decade, more than two-thirds have been in entry-level and low-wage categories.

For the first time in U.S. history there are now more persons working in technical, professional, and managerial positions than in blue-collar positions. But while top jobs requiring education and technical skills increase, there are also growing numbers of low-paid service jobs in retail, food, and associated sectors, and a very dramatic shrinkage of traditional, highly unionized, and well-paid manufac-

turing and industrial jobs. As a result, the nature of Americans' work has been profoundly altered in the past decade.

At the same time, the labor force has also undergone significant changes. White males are now a minority of the U.S. workforce. Women make up 45% of all U.S. workers today. Women are working in larger numbers out of economic necessity, both as single heads of households and as members of dual-earner families. Dual incomes are often essential in an age in which Americans' wages have declined substantially and many workers have been forced to accept lower-paying jobs. Women with children under age six are more than four times as common in the workforce today compared with thirty years ago, and therefore the day care issue is prominent on the policy agenda.

In a very short time, *who* works and *what* work people do have changed in startling ways in the United States.

NEW TECHNOLOGY— BREAK WITH THE PAST

The introduction of automatic machines in industry led to the so-called "Detroit automation" of the 1950s and 1960s. At that time massive and expensive automatic factory systems were introduced for standardized production in auto, rubber, steel, textiles, and related industries. Only one-sixth of the U.S. labor force worked in those manufacturing industries where automation was utilized, but by the early 1960s some saw a crisis in worker displacement and unemployment. Nevertheless, a governmental commission analyzed the problem as a need for greater economic growth.

Starting at the end of the 1970s, and even more in the 1980s, that early picture of dislocation became dramatically sharper.

The silicon chip revolutionized technology in information and production systems. The more intelligent computers also became much cheaper. In the 1950s it took millions of dollars to automate a car factory. Today automating a travel agency, bank, insurance office, or nearly any workplace may cost only a few thousand dollars. The result is that one-sixth of the U.S. labor force today work on computers. Most industries are already automated or subject to the application of microelectronics, whether word processors, desktop computers, numerical controlled machines and robots, computer aided design and manufacturing apparatus, or links between office and factory in computer integrated manufacturing systems. One-half of the workforce is already in workplaces where microelectronic technology has been applied or will be applied very shortly, and the number will continue to grow. Artificial intelligence and new supercomputers are soon to appear on the scene, and the possibilities are endless.

The wide application of new technology has created a new situation, a break with the past. One of the critical new issues is how that technology affects the work environment.

THE WORK ENVIRONMENT

"Work environment" is a holistic concept and refers to the entirety of what happens at the workplace. It includes not only physical and chemical hazards traditionally part of the occupational safety and health picture, but also issues such as technology, job stress, and sexual harassment.

New technology has numerous consequences for workers' health. Sometimes, of course, the new technology represents

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NEW TECHNOLOGY

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an important opportunity for *eliminating* unhealthy work. For example, it is estimated that 40% of auto spray painting is now done by robots, good for saving workers' health although also displacing many from their jobs.

Some of the adverse consequences of new technology for workers include the following:

1. Job loss and fear of job loss are well documented in the research literature and manifested in suicide, depression, alcohol and drug abuse, mental illness, cardiovascular disease, gastrointestinal disorders, and other physical problems.

2. Chemical hazards accompany some of the new technology industries. Electronics manufacturing, for example, uses various solvents which have been documented as neurotoxins or which have other adverse effects.

3. Musculoskeletal problems. The National Institute for Occupational Safety and Health (NIOSH) estimates that 15 to 20% of the U.S. workforce is at risk of musculoskeletal problems. These can result from using certain "high tech" equipment, especially when the machines and the workplace are not designed according to good ergonomic principles that fit them to the needs of the human body. The almost epidemic manifestations of "carpal tunnel syndrome" (a wrist disorder) among grocery clerks, clerical workers, poultry processors, postal workers, and other groups constitute a serious trend. OSHA has cited the Kroger grocery chain for poorly designed scanner check-out counters. This case is important for stimulating a systematic rethinking of good ergonomic principles in the supermarket industry, which has had a high rate of carpal tunnel and other cumulative trauma disorders.

4. Video display terminal hazards. Similarly, there is growing evidence of the wrist, arm, back, and leg problems associated with VDT work, done by many millions of workers. In addition to these musculoskeletal problems, there are well-known lighting and vision questions. A large accumulated body of literature on VDT work exists, so any enlightened employer and active union are capable of implementing good ergonomic principles and properly designed VDT workstations



Industrial robots have been displacing workers in the auto industry, and their use is expected to grow enormously throughout the economy. (Photo: LOHP Photo File.)

to minimize these problems. It is also known how to implement better scheduling and work organization in the VDT workplace. Yet it is amazing that in 1988 definitive and universally accepted evidence on the radiation hazards of VDT work still is not here, and the need is great. Enough concerns have been raised that some labor organizations have at least obtained optional rotation for VDT workers during pregnancy.

5. Stress. The issue of job stress was little considered in the U.S. until the 1980s. In Norway and Sweden stress research was considered during the writing of their national work environment acts; in this country psycho-social factors were virtually ignored in the Occupational Safety and Health Act of 1970. But the rise in workers' compensation cases resulting from stress-related illness is one factor which has increased current U.S. awareness. Workers on microelectronic equipment report growing stress related to monitoring, invasion of privacy, pacing, speedups, and pressure for production. This evidence is well documented in reports from the U.S. Congress Office of Technology Assessment and several national and international health and labor organizations. (See *Bibliography*, page 7.)

In a recent book, author Robert Howard sees us having entered a disturbing "Brave New Workplace," not because of the technology itself but due to how it is used.

UNION SOLUTIONS

The primary objective of this article is not simply to show that new technology is

here and has some potentially significant health hazards, but, rather, to explore some of the approaches which have been taken to address the problems.

Labor organizations in the U.S. traditionally fall back upon their primary approach to defending worker interests—collective bargaining. No union in the country is uninformed today about potentially useful contract language on new technology and work environment questions. Many national unions have published manuals, and university labor education programs and unions run educational programs on this topic. There are a few illustrations worth noting.

The International Association of Machinists and Aerospace Workers (IAM) for some years has had a "Technology Workers' Bill of Rights" which challenges the union membership to think about how technology might be implemented in ways consistent with workers' best interests. In the past year the IAM national education office has developed staff training on new technology. Work environment questions and issues such as electronic workplace monitoring have been part of the IAM's annual new technology conference and have been examined in the union paper, *The Machinist*.

The United Auto Workers (UAW) recently negotiated what might be the most interesting labor-management arrangement in the country. The UAW, General Motors, and Ford have created a health and safety fund paid by hourly wage contributions and jointly run by the companies and the union. The agreement allows for the union to bring in a paid consultant, such as an ergonomist, to advise and consult. Other achievements include active health and safety committees with both company and union representatives and an ergonomics training program at eight GM plants in Michigan, sponsored by the UAW/GM Human Resource Development Institute. New technology and its potentially adverse health and safety effects are being taken seriously, and preventive measures are being explored and applied.

Other international unions have taken up these issues, and in the next couple of years even more will probably do so.

WOMEN, COALITIONS, AND LEGISLATION

Unions, however, now represent less than one in five American workers. And even though 30% of union members are now women, there are many highly feminized workplaces in the clerical and service sectors which are unorganized.

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A Selected Bibliography on New Technology

(The following has been adapted from a bibliography prepared by Steven Deutsch, author of the accompanying article, for his presentation on new technology at a Northern California Occupational Health Center seminar in April, 1988. Although not comprehensive, it should serve as a useful introduction to the wealth of material available on these issues.)

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VIDEO VIEWS

Video Views Combines With Monitor

To All MONITOR and VIDEO VIEWS Readers:

Beginning with this issue, *Monitor* is adding a regular section devoted to news and information about automation in the workplace.

Since 1983, the VDT Coalition has published a quarterly newsletter, *Video Views*, on the health and safety implications of video display terminals, computers, and related new workplace technology. The Coalition, a network of unions and workers based at LOHP, has decided to discontinue *Video Views* as a separate publication. Instead, it will now appear as a section in each issue of *Monitor*.

This decision signals a new direction for the VDT Coalition. When *Video Views* began publication in 1983, VDT health and safety questions were relatively new and were viewed as a "special interest" concern. Over the last five years the impact of VDTs on jobs and health has become a national issue. Computers are now in use in virtually every workplace; in fact, it is estimated that by 1990 over 40% of all U.S. workers will use a VDT. Due in part to groups like the VDT Coalition and publications like *Video Views*, there is now a much higher awareness of problems associated with VDT use and some of the recommended solutions. Because of this explosion of use and interest, the Coalition recognized the need to expand *Video Views'* focus and readership.

The new section will offer the VDT Coalition an opportunity to reach

new people whose working lives will be touched by automation. We anticipate regular coverage of VDTs, other new technology, union responses, regulatory issues, and legislation. With a new, broad focus on workplace automation of all kinds, we can explore questions such as: What do VDT workers have in common with supermarket checkers using laser scanners or auto workers using robots? What have been the experiences of various worker groups when new technology was introduced in the workplace? What lessons can be drawn from these experiences for the future? How can people throughout the workforce ensure that their health and safety are not sacrificed in the push to automate?

The editors of *Video Views* will produce the new section, and we continue to welcome articles, letters, comments, and suggestions about what topics we should be covering. Please send us stories about conditions on the job, contract language dealing with new technology, and reports of victories or successful strategies.

All *Video Views* subscribers are receiving this issue of *Monitor* at no cost, and are invited to subscribe to *Monitor* for our future news and features about the "high tech" workplace.

—The Editors of VIDEO VIEWS

Electronic Monitoring on the Job

Big Brother Is Not Just Watching...

by Rachel Blau
VDT Coalition



Question: What do a word processor operator, truck driver, airline ticket reservation clerk, telephone operator, grocery checker, and sweatshop garment worker have in common?

Answer: These people are among the six million in the U.S. who work in jobs where their every move may be monitored, from the time they start work until they punch out at the end of the day.

Electronic monitoring—the collection, storage, analysis, and reporting of data on employees' work activity—is commonplace today in many industries, especially where there is a high volume of repetitive work and an ample supply of labor.

The most common techniques are *computer monitoring*, often employed with video display terminal operators, which uses software capable of measuring productivity and accuracy or analyzing work output; *telephone call accounting*, where

the employer can see what calls are made, to whom, for how long, and the cost; and *telephone service monitoring*, where a supervisor actually listens in on and/or records the employee's conversation. Many employers are using all three of these methods simultaneously to keep track of their workers.

Still another form of electronic monitoring is the use of magnetic cards to open doors. Often issued to an employee for supposed company security purposes, these cards enable the employer to constantly track the employee's movements. Through a computer printout, the employer can see exactly where each person was and for how long, including the bathroom, lunchroom, and parking lot.

For those employers seeking even better forms of control, the software vendors have come out with "subliminal message" software. All kinds of messages can appear on the screen, flashing for 1/100 of a second anything from a serene nature scene to an outright command to "work faster, like the person next to you." (State legislation sponsored by Assemblyman Tom Hayden (D.- Santa Monica) would have banned the use of subliminal messages in California, but was recently vetoed by Governor Deukmejian.)

The Office of Technology Assessment (OTA), a Congressional research group, estimates that by 1990 one of every three workers in the U.S. will be using a VDT. According to the National Institute for Occupational Safety and Health (NIOSH), two-thirds of current VDT workers in the U.S. are being monitored for job performance. The majority of those being monitored are minority women, who hold the most highly automated office jobs such as data entry.

The use of electronic monitoring as a means of supervision and control is unique in that it affects the employee every minute she or he is working. As a result, new questions are being raised regarding fairness, privacy rights, autonomy, and the negative health effects of monitoring.

WHO IS MONITORED?

Many groups of workers are subjected to monitoring today:

- **VDT operators** are extensively monitored. Without pacing the floor, or even occupying the same room, supervisors can "help" operators meet goals by measuring how many keystrokes and errors are made each minute.

- **Telephone operators** at Pacific Bell and other phone companies are monitored to find out whether they are answering

their calls quickly, correctly, and courteously within the 25 seconds allotted for each call. The time spent, called "AWT" (average work time), is then compared with the other operators to see how it measures up. Supervisors can also determine exactly how many seconds a trip to the bathroom took.

- **Classified advertising employees** working at newspapers often are monitored as to how many ads they take per hour. They are required to log in and out even when they use the dictionary.

- **Airline reservation clerks** are monitored for speed, accuracy, and the content of their conversation. Callers who forget to have a pencil handy, or who are simply ambivalent about when they want to take off, can inadvertently make these workers' statistics look bad. Often supervisors randomly listen from another room to judge whether or not clerks "sell" the flight effectively, and if they push the current "specials" such as rental cars.

"Nine to Five" (the National Association of Working Women) reports that United Airlines flight reservationists are allotted a total of 12 minutes for bathroom breaks during their 7.5 hour shift. When one worker overstayed her time by 13 minutes, she was threatened with being fired. Subsequently she suffered a nervous breakdown. "She (the supervisor) told me that while I was in the bathroom my co-workers were taking extra calls to make up for my 'abusive' work habits," the employee said.

- **Long distance truck drivers** seem to enjoy autonomy out on the road, away from the constant supervision that an office or factory job holds. But with the

introduction of computerized road monitoring, many drivers working for Kimberly-Clark are required to produce a computer printout of almost every detail of their run, including their speed and gear along with the time and length of each stop. The company claims to have saved millions of dollars in fuel and maintenance costs through the system. But from the driver's point of view, he might as well invite the supervisor along for the ride.

- Conversation with your **grocery checker** may knock down his or her scanning speed, which is monitored by a computer. One Safeway checker, when asked if she got a copy of her monthly speed record, replied, "Oh, sure, they post all of our numbers in the break room—some break!"

MONITORING AT THE TOP

Many jobs that would seem to be safe from surveillance in fact are not. Even the most interesting, complicated, and highly skilled work can be monitored as to speed and quality. Many stockbrokers, computer programmers, and bank loan officers have had their work reshaped for the sole purpose of tracking.

In her recent book *The Electronic Sweatshop*, Barbara Garson describes a new software program called *Productivity Map*, designed to keep track of management performance. People who work in the areas of finance, personnel, and research can be tracked and given a performance score.

During an interview with an executive at GTE, Garson asked if a measuring system

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Even long-distance truck drivers have been subjected to electronic monitoring. (Photo copyright © Ken Light.)

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could be applied to professional staff engineers. The answer was, "Oh, engineers! They're the worst. They don't want to think they can be measured. But if there's an output, it can be measured; if there isn't an output, then what do they hold the job for?"

COST EFFECTIVENESS

Employers view monitoring as a useful production tool aimed at controlling labor costs and reducing waste, fraud, and abuse of property. For example, in its recent study "The Electronic Supervisor: New Technology, New Tensions," OTA points out that the federal government has lost several million dollars from long distance personal phone calls made by employees on work time, calls which could be controlled with monitoring techniques. And management at United Airlines has labelled monitoring "an attempt to enhance the company's competitive position" in an extremely competitive field.

Management appears to believe that monitoring is cost effective. It is indeed spending considerable money on monitoring equipment. The *Wall Street Journal* reported in 1985 that Bank of America spent \$1 million installing a computer monitoring system in its credit card division. The *San Jose Mercury News* said that the local Honeywell office sold \$500,000 in magnetic card entry systems in 1986.

But companies seeking short-term profits seem to ignore potentially enormous losses down the road resulting from stress-related health problems, absenteeism, high turnover, and even sabotage. Stress-related illness already costs U.S. business between \$50 and \$75 billion per year, according to OTA. And illness is not the only cost: at an April, 1987 conference sponsored by the New York AFL-CIO and the New York State School of Industrial and Labor Relations at Cornell, "Nine to Five" member Sharon Danann demonstrated that pressure from monitoring and other stressors can often lead to a drop in productivity.

STRESS

Much of the work done by monitored workers is monotonous and repetitive. It usually involves tremendous pressure to work quickly, often in an environment that is poorly designed and lacking in fresh air. In many jobs the employee has no control over the pace of work; the work is machine-paced. For example, at the phone com-

panies a new call is immediately "fed" to the directory assistance operator after a voice synthesizer completes the previous transaction, reading a phone number to that customer.

In work situations where the employee is driven to be very fast yet must also be courteous to a caller, he or she is faced with a nearly impossible task.

As yet there have been few concrete studies that directly link electronic monitoring with stress. However, monitoring is most prevalent in precisely those types of jobs which have been shown to have an unusually high level of stress already. For example, clerical workers are heavily monitored and are also subject to unusual stress. NIOSH studied 22,000 workers of various occupations and found that clericals had the second highest incidence of stress-related problems—even higher than air traffic controllers. When NIOSH studied San Francisco Blue Cross/ Blue Shield clericals in 1980, these heavily monitored workers exhibited much more depression, anxiety, instability, fatigue, and anger than a control group.

Stress can cause long-term physical problems. A 1980 study of women clerical workers in Framingham, Massachusetts found that the group developed coronary heart disease at almost twice the rate of other women workers. Stress has also been clearly associated with numerous other disorders, ranging from gastrointestinal and nervous system problems to sleep disturbances and alcoholism.

Stress-related problems are at the top of the list of causes for workers' compensation claims of U.S. employees under 40. Yet it is often difficult to prove scientifically that stress is debilitating (and that it was caused by work). Stress-related problems occur over time, as a result of our minds and bodies trying to adapt to a stressful situation.

As monitoring becomes more pervasive and widespread, what management feels is an "acceptable" level of stress may be driven upward.

PIECEWORK AND FAIRNESS

Theories of monitoring largely rely upon Frederick Taylor's nineteenth-century principles of "scientific management," which were originally developed to rationalize factory work and make it more efficient. Most monitored jobs today, from answering telephone calls to professional work, have been broken down into a series of repetitive and measurable tasks. Often industrial engineering consultants are called in to conduct "time and motion" studies in order to set performance standards for

each movement an employee makes. Whether that standard is fair is a question that is crucial to monitored workers.

Along with standards and quotas, many employers implement "pay for performance" schemes, where the employee starts off receiving a base pay and is paid more for each extra amount he or she is able to produce. This practice is reminiscent of nineteenth-century piecework. A survey by Hay Management Consultants found that 200 U.S. companies are currently using the "pay for performance" incentive. While some of the faster employees may enjoy the added pay that comes from working at a speeded-up pace, others claim that the incentive is used to gradually drive up the standard: as soon as a certain percentage of employees are receiving the extra pay for going faster, the standard is raised.

Many managers argue that monitoring for speed and accuracy creates a very fair basis on which to evaluate an employee. They say that the employee is evaluated on objective criteria and may no longer be harassed by biased supervisors. However, many employees point out that individual monitoring doesn't take into account any "human circumstances" or machine problems. Usually employees are not given the opportunity to challenge statistics generated by the computer.

For example, a telephone operator can be disciplined for a drop in her "average work time" based on a computer printout. The printout, however, might not take into account machine downtime, customers with multiple requests, or a caller's limited English skills. One telephone operator at AT&T in Illinois remarks: "The *subjective* nature of monitoring is unfair and demeaning. It's as if your word does not count and there is no way of proving you're right and the machine is wrong."

New technology has opened up avenues of electronic surveillance that were never before possible. Should this technology be used just because it exists?

Do employers have the right to use any method of supervision that they feel works? Many employers would argue that they aren't spying on us in our homes; they've offered us a job in their workplace and we've agreed to work there and be supervised.

But is monitoring just a modern version of supervision, no more intrusive than other forms of supervision and evaluation? Or is monitoring something more? When an employee accepts a job does he or she give up all rights to privacy and autonomy? At what point does the *tracking* of the work actually become the *testing* of the individual worker—testing

more continuous and pervasive than ever known in the workplace before?

MONITORING AROUND THE WORLD

Concerns about monitoring are now being raised by monitored workers, unions, and governments around the world.

In countries where large numbers of workers are protected by unions, the employees have much more control over workplace issues, including monitoring. For example, OTA reports that in both Sweden and Norway, Work Environment Acts contain language protecting employees in many industries against machine pacing and individual monitoring. The basis of this language is a consensus that these practices are destructive to human dignity and the quality of work life.

In West Germany and Holland, employee involvement in the use of new technology is a legal right. Several West German unions have been successful in protecting their workers against the use of individual monitoring, allowing only the collection of aggregate data.

Canadian workers have taken up the issue of electronic monitoring since the early 1980s, focusing mostly on banning individual monitoring. The Canadian Union of Postal Workers successfully fought against the use of electronic surveillance and individual monitoring. Also, the Brotherhood of Railway and Airline Clerks in Canada recently won contract language limiting the use of individual monitoring and providing a structure for reviewing complaints about monitoring. The British Columbia telephone workers' union successfully negotiated language that prohibits individual monitoring of clerical and some other workers. (Since the early 1980s, these telephone workers have been refusing to hook up a monitoring system for call accounting.) Several bills have been introduced in Canada to ban individual monitoring, but most have been unsuccessful.

U.S. UNIONS ACT

Many U.S. unions have adopted positions against individual monitoring, including the Auto Workers; Communications Workers; Electrical Workers; Machinists; Newspaper Guild; Office and Professional Employees; Postal Workers; Service Employees; State, County and Municipal Employees; Steelworkers; Teamsters; Typographers; and various other government employee unions.

Several have taken up monitoring as a bargaining issue. The Communications

Workers negotiated a monitoring agreement at Pacific Bell whereby a red light will appear when workers are being monitored. (The light indicates that at least one person is being monitored, but not which person.) The Communications Workers have also negotiated other contracts prohibiting remote telephone surveillance without notice. And a 1984-87 contract between the Auto Workers and Michigan Blue Cross/Blue Shield contained language ensuring employee and union involvement in setting production standards, including a grievance procedure to address unfair standards.

A few unions and employers have under-

taken innovative experiments to find less stressful alternatives to monitoring. For example, members of the Communications Workers at the Hotel Billing Information System in Tempe, Arizona, together with AT&T management, successfully redesigned their style of work. According to OTA:

"The employees changed the traditional work monitoring practices. They eliminated individual measurement and remote secret observation. AWT (average work time) was measured only for the whole group. Service observation was performed by small groups of peers by the old-fashioned "jack-in" method,

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Computer Monitoring Safeguards

The Campaign for VDT Safety, a joint project of "Nine to Five" and the Service Employees International Union, has proposed a number of safeguards to protect monitored VDT operators. Pointing out that electronic monitoring is often used in unproductive, invasive, and punitive ways, causing job stress and threatening privacy rights, the Campaign says that the best protection against abuse is the elimination of involuntary individual monitoring. In addition, the Campaign makes these recommendations:

RIGHT TO KNOW

- Ban the use of subliminal message software programs.
- Notify workers when auditory, visual, and VDT surveillance occurs.
- Allow complete access to individual personnel files, inform workers how data is collected and used, and provide explanations of how to interpret the data.

RIGHT TO DUE PROCESS

- Establish grievance procedures to appeal unfair or incorrect data, and to adjust pay based on such data.

ESTABLISH MEANINGFUL STANDARDS

- Collect work statistics by work group, not by individual.
- Prohibit speed-ups. Prevent use of incentive pay schemes or other productivity rewards to increase work quotas unfairly.
- Bar the use of monitoring results to discipline workers.
- Require measured data to be meaningful and relevant to work, e.g. tracking breaks is unnecessary.
- Compute average worker performance by month, not by week or day, to allow for variability.
- Sample employee performance periodically rather than continuously.
- Consider quantitative measurements as only one component in employee evaluations.

In addition, the group recommends that those negotiating collective bargaining agreements work for language which guarantees that productivity standards and work quotas, if any, are set with employee input and in a flexible way. For example, the process of setting standards and quotas should take into account the possibility of system problems and "down time," the need for work quality, and the variability of workload.

—Rachel Blau

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where the observer sits beside the person being monitored, listens to a few calls and then discusses the results with the employee."

As a result, the employees' AWT was better than under the previous methods of supervision, and there were fewer customer complaints, along with a boost in worker morale.

LEGISLATION

It has been estimated that only about 15% of monitored workers in the U.S. are unionized. In addition to collective bargaining efforts, opponents of monitoring abuses are also focusing on federal and state legislation.

Senator Paul Simon (D.-Illinois) and Rep. Don Edwards (D.-California) re-

cently introduced federal legislation (S1124 and HR1950, respectively) to ban the use of secret telephone monitoring. These bills failed to make it out of committee, however.

West Virginia and Wisconsin have already outlawed telephone surveillance without notice. The most comprehensive monitoring bill in the U.S. has been proposed by the Massachusetts Coalition on New Office Technology (CNOT), and was sponsored in the state legislature by Rep. Sherwood Guernsey (D.-Williamstown, Mass.) This bill would require employers to provide all employees with a written disclosure stating what forms of electronic monitoring are being used, how frequently monitoring will occur, and how the employer intends to use monitoring to set standards. It addresses the issue of privacy by prohibiting the collection of information that is irrelevant to the individual's actual work performance. It also

bans the use of monitoring as the sole basis of evaluation and disciplinary action; it provides for employee access to information; and it gives workers civil remedies when violations of the law occur. The bill, called "An Act to Prevent Potential Abuses of Electronic Monitoring in the Workplace," was tabled after its first hearing but will go before the Massachusetts legislature again next year.

There will no doubt be many more legislative efforts in the years to come. "Big Brother" is not only watching, but he is also listening in on our phone calls and measuring our speed at the keyboard. Management use of monitoring is expected to become more widespread as the cost of the technology drops. This new form of control involves our privacy rights and our dignity as well as our bread and butter. Unions, civil rights groups, and many others are beginning to speak out.

Cal/OSHA's VDT Study Pushes Ahead



Problems with screen positioning, lighting, and glare are only a few of the health and safety issues surrounding video display terminals. (Photo copyright © Ken Light.)

Despite the controversy and confusion which have surrounded California's occupational safety and health program, Cal/OSHA, for the last two years, Cal/OSHA's Ad Hoc Advisory Committee on Video Display Terminals is continuing to study VDTs and to discuss possible new state VDT regulations. (See page 2 for recent Cal/OSHA developments.)

The Committee, created by Cal/OSHA in mid-1987 after unions petitioned for a VDT standard, is to make recommendations to Cal/OSHA on what, if any, VDT standards are needed in California. Its 20 representatives from labor, industry, medicine, and academia have met periodically to consider VDT hazards, including visual and musculoskeletal problems, ergonomic issues, stress, and possible reproductive effects.

A legislative resolution introduced this summer by Assembly member Tom Hayden (D.-Santa Monica) directed Cal/OSHA to convene the committee regularly and established a deadline of May, 1989 for the final Committee report to Cal/OSHA. The resolution passed both houses of the legislature and does not require Governor Deukmejian's signature.

A more detailed examination of the Committee's work will appear in the next issue of *Monitor*.

Kaiser Study Finds High Miscarriage Rate in VDT Workers

by Laura Stock

LOHP Labor Coordinator

On June 1, 1988, researchers from the Kaiser Permanente Medical Care Program in Oakland, California released the results of a study which adds new evidence that pregnant women who work with video display terminals face reproductive hazards. The researchers found that women who used VDTs more than twenty hours per week during their first trimester of pregnancy had almost twice as many miscarriages as women who did not use VDTs.

The study, "The Risk of Miscarriage and Birth Defects Among Women Who Use Visual Display Terminals During Pregnancy," appeared in the June issue of the *American Journal of Industrial Medicine*.

Researchers Marilyn Goldhaber, M.P.H., Michael Polen, M.A., and Robert Hiatt, M.D., Ph.D. tracked the pregnancies of almost 1600 women attending three Kaiser Obstetrics/ Gynecology clinics. Their study was originally designed to assess the effects of the pesticide malathion, which was sprayed in California during 1981 and 1982 to combat the Mediterranean fruit fly. Because questions about VDT use were included, the association between VDTs and miscarriages was uncovered.

Subjects were divided into four occupational groups: managers/ professionals; technical/sales; service/blue collar; and administrative support/clerical. Among the clerical group, workers who used a VDT for more than twenty hours per week had 1.8 times the number of miscarriages experienced by those not using a VDT. With regard to birth defects, an increase among VDT users was also detected, but it was not statistically significant.

The Kaiser researchers were careful to point out that the study was not designed to determine the cause of the miscarriages, only to evaluate a possible association. Goldhaber told the *New York Times*: "We cannot answer the question of how this is happening— whether the increased rate that we found was related to the computer itself, or to the workplace, or stress in the workplace..."

According to Dr. Hiatt, the fact that the clearest increase in miscarriages was found among clerical workers using VDTs could point to stress as a possible cause, since other research has shown that clerical VDT users experience much higher levels of stress than professional users. What is clear, Hiatt said, is that "our study indicated much more research is needed. It is clearly premature to dismiss the possibility of an association between VDT

use and pregnancy problems."

The Kaiser study is not the first to associate heavy VDT use with adverse reproductive outcomes. This work corroborates findings of a University of Michigan study published in 1986. University of Michigan researchers also found a higher rate of miscarriages among workers who used a VDT more than twenty hours per week. However, unlike the Kaiser study, the Michigan results did not show an increase which was statistically significant. Other research suggesting a reproductive hazard connected with VDT work has been done in Canada, Sweden, and other countries.

In order to continue the research, Mt. Sinai School of Medicine in New York City has been planning a large-scale study of VDTs and reproduction. Researchers there plan to study 8000 office workers, half of whom use VDTs. In addition to monitoring reproductive outcomes, the Mt. Sinai group plans to measure radiation emissions from the terminals and to evaluate the design of workstations in an attempt to pinpoint the possible cause of pregnancy problems. To date, a pilot study has been funded but researchers await funding for the larger study from the National Institutes of Health.

Labor Applauds, Questions New ANSI Standard on VDT Workstations

On February 4, 1988, after six years of discussion and revision, the American National Standards Institute (ANSI) finally voted to accept new voluntary guidelines for the design of video display terminal workstations.

ANSI is a non-profit organization, based in New York City, which develops standards on a wide range of technical subjects. Although its standards are voluntary and do not carry the force of law, they have considerable scientific prestige.

ANSI's "American National Standard on Human Factors Engineering of Visual Display Terminal Workstations," known more simply as the ANSI VDT Standard, covers in detail various issues of engineer-

ing ergonomics which arise in the VDT workplace: machine characteristics, furniture design, and environmental factors such as lighting and noise. According to labor groups, however, it fails to deal with other important aspects of ergonomics, such as job design and work practices. Labor spokespersons say that the committee which wrote the standard steadfastly refused to recommend additional rest breaks, "alternative task" breaks, or extended vision care programs for VDT operators.

Developed by ergonomics specialists and industry representatives under the auspices of the Human Factors Society, the standard was reviewed by experts and

interested parties prior to its adoption. However, only three labor organizations ("Nine to Five," an affiliate of the Service Employees; the Communications Workers; and The Newspaper Guild) were asked to review it. Some of labor's suggestions, however, did result in small improvements.

A statement released by "Nine to Five" said: "We are delighted that computer manufacturers and major employers have taken VDT discomfort and pain seriously enough to have participated in the drawn-out ANSI standard development process. The standard is a good minimum level of

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ANSI

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protection for VDT users, and can be used as an excellent reference to support ergonomic provisions in proposed legislation and contract negotiations. Legislation can also be proposed that *requires* com-

pliance with the ANSI standard by a given date, as did Assemblyman Floyd's bill in California last year.

"On the other hand, we find it... extremely disappointing that the standard is based on engineering design alone and disregards the design of work practices. Human beings simply cannot remain in fixed postures for hours at a stretch, even if the

design of the furniture and equipment is superlative. The measures we propose must go beyond the ANSI standard, while using it as a building block."

Copies of the ANSI standard (#ANSI/HFS 100-1988) can be ordered for \$25.00 (prepaid) from: Human Factors Society, P.O. Box 1369, Santa Monica, CA 90406. Phone: (213) 394-1811.

Suffolk County, N.Y. Passes VDT Law

by Laura Stock

LOHP Labor Coordinator

On June 14, 1988, Suffolk County, N.Y. approved the first U.S. law regulating VDT working conditions in both public employment and private industry.

After the county's legislature had passed the bill on May 10, County Executive Patrick Halpin vetoed it, claiming such a measure would place the county at a competitive disadvantage in attracting and keeping industry. The legislature rejected the argument, overriding Halpin's veto by a vote of 13 to 5.

The Suffolk County law, sponsored by Rep. John Foley (D.), covers any public or private workplace with 20 or more terminals and applies to any employee in such a workplace who works 26 or more hours weekly on a VDT. Employers are required to:

- provide eye exams within 30 days of hiring and every year thereafter; pay 80% of fees for exams and for any glasses prescribed specifically for use at a VDT;
- provide terminals with detachable keyboards, as well as adjustable chairs with back rests, adjustable tables, and copyholders;
- take steps to minimize glare through lighting redesign, terminal placement, or glare screens;
- minimize printer noise by isolating printers or attaching printer covers;
- provide minimum breaks of 15 minutes for every three hours' work on a VDT. (Alternative work may be assigned during these breaks.)

In addition, employers must establish education and training programs for employees, detailing potential health hazards associated with VDT use and explaining protective measures which can be taken to alleviate problems. The law also will create a Video Display Terminal Review Commission, which will meet at least three times a year and produce a report every other year recommending any changes to the bill that it may deem necessary.

The law will apply only to equipment purchased or leased after January 1, 1990.

Although a number of states (including California, New Mexico, Washington, and Massachusetts) have issued VDT guidelines for state employees, the Suffolk County law is the first that applies to all workers both public and private.

A group of business leaders have sued Suffolk County to block implementation of its VDT law. One argument made by the business group, led by the Long Island Association, is that the county exceeded its jurisdiction, usurping the authority of the state and federal governments to regulate the workplace.

In response to the suit, Paul Sabatino, counsel to the Suffolk County legislature, told *Newsday* that "I think [it] is just a dilatory tactic to delay implementation of the bill and pressure the legislature to make changes."

Since the passage of the Suffolk County measure, the New York State AFL-CIO has begun a campaign to pass similar laws in other counties as well as in the state legislature.

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Continuing Education Program

LOHP Offers 1989 Courses on Asbestos and Industrial Hygiene

LOHP's Continuing Education program will present two major week-long health and safety courses in the San Francisco Bay Area in early 1989.

Sampling and Evaluating Airborne Asbestos Dust (NIOSH Course #582) will be offered January 23-27, 1989, at the Holiday Inn, 1800 Powell Street in Emeryville, California.

Recently there has been an explosion of concern about asbestos in workplaces and other buildings. Methods for detecting asbestos, and for measuring the concentration of fibers in air, have been standardized by federal agencies like NIOSH and OSHA to ensure consistent results.

Primarily designed for professionals who are responsible for collecting and analyzing asbestos samples, LOHP's course will familiarize participants with sampling and evaluation equipment and with accepted analytical techniques. It will cover various asbestos fiber counting methods, emphasizing NIOSH's "Method 7400" and the OSHA Reference Method. Students will gain first-hand experience using microscopes for fiber counting. Computation of results, using a scientific calculator, will also be covered.

The course will be led by Daniel D. Cox, Ph.D., C.I.H., Senior Industrial Hygiene Consultant for The FPE Group in Lafayette, California.

Course fee is \$600., including materials and a certificate of completion. The course is approved by NIOSH and will offer Continuing Education credit for industrial hygienists. Federal OSHA requires all individuals performing asbestos analysis to complete a course of this type. For successful completion of the course, participants must pass a final examination. Each student is required to bring a calculator and microscope; contact LOHP for details.

Rooms are available at a discount rate at the Holiday Inn. For more information, please call LOHP's Continuing Education Coordinator, Lela Morris, or her assistant Stephanie Cannizzo at (415) 642-5507.

Fundamentals of Industrial Hygiene, the second week-long course, is a basic introduction to industrial hygiene which should be of interest to plant and personnel managers, supervisors, union representatives, nurses, safety engineers, new industrial hygienists, and those in the fields of risk management and loss control. It will be held February 27- March 3, 1989 in the Berkeley/ Oakland area, with the exact location to be announced.

The course is co-sponsored by the Northern California Occupational Health Center (with which LOHP is affiliated) and the National Safety Council. Course director is LOHP industrial hygienist Bar-

bara A. Plog, M.P.H., C.I.H., C.S.P. Other instructors include Jeffrey Jones, M.P.H., C.I.H.; Patricia Quinlan, M.P.H., C.I.H.; and specialists from industry, academia, government, and occupational medicine.

Among the topics covered will be: overview of industrial hygiene; the many disciplines that interact with industrial hygiene; fundamental terms and concepts; hazard evaluation and control; toxicology; chemical, physical, and biological hazards; ergonomics; occupational epidemiology; respiratory protection fundamentals; ventilation; medical monitoring; standards; and sampling. This is not a study course for the Certified Industrial Hygienist (CIH) exam, but rather an introduction to the field.

Course fee is \$895., including materials and refreshments. National Safety Council members may attend for a discount rate of \$725. Each participant will receive a copy of the textbook *Fundamentals of Industrial Hygiene*, 3rd edition, edited by Barbara A. Plog and published by the National Safety Council in 1988.

For more information, please call LOHP's Continuing Education Coordinator, Lela Morris, or her assistant Stephanie Cannizzo at (415) 642-5507.

LOHP expects to repeat this course June 26-30, 1989.

Nurses' Journal and LOHP Highlight Minority Job Hazards

As a result of LOHP's major 1987 conference, "Minority Workers: The Impact of Work on Health," Continuing Education coordinator Lela Morris has been invited to serve as guest editor of a special double issue of the *American Association of Occupational Health Nurses Journal* devoted to minority workers' job hazards.

The 1987 conference (covered in the Spring, 1987 issue of *Monitor*) was presented under the sponsorship of the National Institute for Occupational Safety and Health (NIOSH). In recent years, NIOSH has attempted to focus more attention on the fact that a disproportionate number of ethnic minority workers are employed in high risk, low paying, and physically demanding jobs, and thus suffer from increased occupational disease

and injury.

Extensive material on minority hazards has been collected by Ms. Morris from researchers and activists around the U.S., from speakers at the 1987 conference, and from the LOHP staff's own work. Encompassing both new contributions and classic works on the subject, the material will be featured in the February, 1989 and March, 1989 issues of the *AAOHN Journal*.

LOHP staff who contributed material to the project include Darryl Alexander, Elaine Askari, Robin Baker, Gene Darling, and Ms. Morris.

Topics to be covered in the special double issue range widely over the entire spectrum of minority health and safety concerns. They include: minority illness and injury rates; pesticides and agricul-

tural workers; AIDS and minority health care workers; Black workers' hazards; lead and minority workers; toxic wastes and race; bus drivers and hypertension; health and safety education in community clinics; and many other issues. There will also be reviews of relevant books and audiovisual resources.

The two issues (February and March) will be available from the *AAOHN Journal's* publisher in early 1989 for \$7.00 each, including postage and handling. (Orders from outside the U.S. are \$13.00 per issue.) Prepaid orders only are accepted. Order from: *AAOHN Journal* (ISSN 0891-0162), c/o SLACK, Inc., 6900 Grove Road, Thorofare, NJ 08086-9447. Phone: (800) 257-8290.

NEW TECHNOLOGY

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Yet these sectors and the women who work in them are experiencing the most extensive application of computerization.

In the absence of a highly organized workforce, coalitions have been building among women's organizations, unions, health professionals, environmentalists, and others to address the health and safety issues of the 1980s. These coalitions have struggled for worker and community right-to-know about toxics, plant closing notification, VDT worker protection, and other goals. Many states have considered legislation proposed by such groups; some have passed a few bills and executive orders, largely affecting public employees. Some states have passed or are exploring legislation related to electronic monitoring, seen as a stress and health issue.

In sum, the limits of organization and collective bargaining have led the labor movement to join in coalition with others to achieve legislative reform on new technology and work environment issues. More of this activity will surely develop in the next few years. Women's groups and unions understand that new technology especially affects women workers and that work en-

vironment and occupational health questions loom large for an increasingly female workforce.

WHO MAKES THE DECISIONS?

For those who wish to alter how technology is used it is critical to recognize *where* the design and implementation decisions are made. Typically they are not made on the shop floor at the local workplace. Influence should be sought at the corporate/managerial level where the decisions are really made, as well as with vendors and manufacturers of new technology equipment and systems.

NEW TECHNOLOGY ABROAD

Some suggestions from abroad are helpful to stimulate new thinking. In Norway, a Work Environment Act was passed in 1977 which included a provision on technology as a health problem. It mandated that unions and workers must be consulted about technological change, participate in it, and get adequate training.

In Sweden, a 1977 Codetermination Act and a 1978 Work Environment Act similarly required that workers and their representatives be active partners in design and implementation of new technology.

Standards for VDT work are also in effect in Sweden, limiting work on a VDT to half the work day and mandating time off just before ending the day. Sweden has also paid a great deal of attention to the issue of worker privacy and has adopted limitations on monitoring and personnel records. Stress has been taken most seriously in Sweden, with emphasis given to removing identifiable stressors (including computer monitoring practices) from the workplace.

In Norway and Sweden, workers are given paid time off from their jobs to take a 40-hour "Better Work Environment" course which includes a substantial unit on ergonomics and new technology issues.

Finally there is the perennial question of where to obtain funds for research and workplace improvements. Research in the Scandinavian countries is done by many governmentally-funded bodies; in Sweden there is also a small (4/100 of one percent) tax on payroll that provides ample support for the Swedish Work Environment Fund.

What if we had a one-cent-per-hour wage fund for health and safety in the U.S.? That would be 110 million pennies every hour, every day, every week all year around. It might help solve new technology health problems before they get worse.

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