

A Women's Occupational Health Resource Center Report

**VIDEO DISPLAY TERMINALS:
INTERNATIONAL TRENDS IN LEGISLATION
AND COLLECTIVE BARGAINING**

by

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CHAPTER I

INTRODUCTION AND OVERVIEW

Although massive in its impact, the introduction of computers into the non-manufacturing sector of industry, particularly into white collar office jobs, does not represent a radically new approach to doing business. Rather it is the logical extension into the white collar world of new technology and automation. Similar changes have occurred in other sectors of the economy, particularly heavy industry. Computerized office machines have changed the nature of office work, both in quality and in quantity, and have raised questions about the health and safety of white collar workers and about their future job security. Many of these issues and questions were, of course, present before the introduction of VDTs, but the massive and rapid changes associated with automation of the office have, in many instances, crystallized them.

In this report recent international trends in legislation, in the development of model codes and guidelines by labor, industry and government, and in collective bargaining agreements from around the world are examined. Since collective bargaining on issues relating to the introduction of all forms of new technology in the workplace has become one of the leading bargaining issues of the decade in all sectors of the economy, this report compares the collective agreements (and model guidelines established by unions) negotiated for VDT work to those negotiated for other forms of new technology in heavy industry.

This report is written on the assumption that readers are familiar with the basic issues of occupational health and safety and with workplace design issues associated with the use of VDTs in the office. Readers not familiar with these issues may wish to refer to general background references on VDTs.

Legislation

While many countries have issued model codes of practice for work involving VDTs, or have recommended guidelines for the use of video display terminals in offices, very few have passed laws or issued binding regulations governing VDTs. And, in those countries in which such legislation or regulation has been promulgated, it has, in general, consisted of very specific rules governing the technical aspects of machine and workstation design. The larger organizational and social issues of job design, remedies for the possible displacement of workers by the new VDT technology, worker involvement in change processes, the quality of work life, and

even the maximum hours of VDT work, are not covered by legislation in the vast majority of countries. The accompanying table summarizes international legislation as it existed at the end of 1986.

As can be seen in the table, *Sweden* and *Norway* have issued specific VDT regulations concerned with ergonomic factors. In *Austria* and *France* work entailing the use of VDTs has been included, by reference, in the general labor laws governing night work and hazardous occupations (*Austria*) and in the list of jobs which require medical surveillance (*France*). The French also provide detailed directions for occupational physician on the minimal medical requirements for such surveillance.

Within the *European Community*, the *Federal Republic of Germany* was the first to formulate a set of central-jointly agreed upon regulations on the use of VDTs. The regulations are based on the highly technical machine and workstation specifications issued by the German Federal Standards Institute, DIN. (Berufsgenossenschaft et al, 1980 and EIRR, 1981) DIN is a standards-making body similar in function to Underwriters Laboratory or ASTM in the United States. These DIN regulations do not deal with job design or worker involvement questions but only with the engineering of the machines. Other countries, such as *The Netherlands*, have general provisions which cover new technology within their Work Environments Act but have not formulated specific legal requirements for VDTs or workplaces employing VDTs.

In North America no national regulations have been formulated either in *Canada* or in the *United States*, although several individual American states have promulgated laws either mandating further study of the situation so that official "findings" can be made, or prescribing minimal ergonomic criteria for working conditions, such as lighting characteristics or detachable keyboards. These regulations, however, generally only apply to a limited number of employees, usually those employed by the State government within the States.

Model Codes and Guidelines

Although most governments have passed no laws governing VDTs, many governments, on the national, state and municipal levels, have issued official guidance or specific guidelines containing recommendations on how these machines should be constructed and used. The major manufacturers' associations and some individual computer manufacturers have also issued guidelines, as have a number of

trade unions and trade union associations. The details of some of these are provided later.

Without exception the guidelines issued by governments and manufacturers deal with the ergonomic features of the workstations and/or terminals. Most discuss the maximum hours of work. No examples were found in which organizational or job design issues such as consultation with workers or their representatives prior to the introduction of new technology, were covered. Indeed, rather than tackling these fundamental issues of the design of work, the trend seems to be in the opposite direction. In the Federal Republic of Germany, for example, the Federal Labour Tribunal, which can roughly be considered analogous to the National Labor Relations Board in the United States, has specifically determined that the Works Councils, which are the legally recognized and mandated worker bodies through which co-determination functions in the Federal Republic, have no general right to co-determination regarding the layout of video display units workplaces. (FRG, 1983). This ruling thus appears to differentiate strongly between co-determination rights in white collar workplaces involving electronic data and word processing and other industrial workplaces.

Collective Bargaining and Safety and Health

The automation of the office is occurring at a time in history when the consciousness and experiences of workers, employers and governments have been sensitized to issues related to occupational health and safety. Thus, it is not surprising that an analysis of international trends in collective bargaining and of legislation affecting workplaces employing video display terminals clearly reflects major safety and health issues. Indeed, the major emphasis of collective agreements governing VDTs over the past five years has been on the health and safety aspects of VDT-based work.

In general the focus has been on the following areas:

- ***Hours of work**, including specification of rest pauses and maximum hours to be worked in front of a VDT screen;
- ***Definition of technical specifications** for the terminal (e.g. screen color, keyboard design, movable screen);
- ***Specific minimum ergonomic requirements** for the workstation (e.g. height of work top, adjustable chair);
- ***The lighting system design and the lighting levels** to be available;

- *The right to a **pre-placement eye examination** and regular **re-examinations**;
- *The provision of **eyeglasses** specifically for VDT viewing distances and conditions;
- *The right for **transfer during pregnancy** without loss of benefits;
- ***On-going review** of new research findings, with their possible implementation, as they become available.

Virtually all the agreements discussed in this report make some provision for rest pauses and for maximum hours of VDT-based worked, although the length and frequency vary greatly from contract to contract and from country to country.

Most contracts specify, at a minimum, the necessity of having have an ergonomically designed workstation and terminal, with a lighting system that will minimize glare and maximize screen contrast. Some collective agreements, however, specify, in great detail, the required technical characteristics of the terminal to be used. Such characteristics can include the size and shape of the letters in the display, the refresh rate and the shape and design of the keyboard. Two examples of the extent of detail available are given in Figures 1 and 2, taken from the agreement between the State Bank of Victoria and the Australian Bank Employees Union.

Eye examinations prior to placement, and at regular intervals thereafter, or at the request of the employee, are generally part of the collective agreements. Whether the clinician is chosen by the employer or the employee, however, varies greatly. In many agreements if special eyeglasses are needed for the VDT work, these are to be provided at the employer's expense.

A controversial provision that has been negotiated in several contracts has been the right for transfer to a job not involving VDT's during pregnancy. Some agreements explicitly state that this right to transfer has been agreed upon despite the fact that no definitive evidence of the adverse effect of VDT's on pregnancy outcome has been found.

Comparing Collective Bargaining for New Technology and VDTs

The International Labour Office (ILO, 1984) has analyzed a large number of union contracts with provisions covering the introduction, implementation and usage of new technology and has found that the major provisions of these agreements could generally be characterized as including many of the following provisions: :

- *The **definition** of the technology to which the agreement

applies;

***Advance notice and information disclosure** to workers and/or their representatives about the new technology;

***A requirement for consultation or negotiation** on any or all of the aspects of the introduction of the new technology of concern to workers, including the establishment of procedures for such consultation or negotiation;

***Access to outside expertise** by workers and their representatives, or by joint labor-management committees, to assist them with technical aspects of the technology;

***A contractually specified role** for union representatives in the procedures leading to the introduction of new technology, including consultation or prior negotiation over the technology;

***Training** in the new technology for workers and workers' representative.

***Training or retraining** for workers, especially those whose jobs are eliminated or changed by the new technology;

***Issues of work organization** such as job design, job content and job satisfaction are matters open to negotiation;

***The use (and usually, prohibition) of monitoring of workers' performance** with the technical means available under the new technology;

***Job grading and evaluation procedures**, where characteristics of jobs are created or changed by the introduction of new technology, are specifically detailed;

***The sharing of benefits**, such as higher pay or shorter hours derived from the new technology, by workers ;

***Issues surrounding the hours of work**, such as reduction or rearrangement of weekly working hours, or shift work associated with the introduction of new technology;

***Issues of job security** resulting from the retrenchment of workers, or the obsolescence of their skills, as a result of automation

Collective Agreements Covering Introduction of VDTs

Analysis shows that in general there has been less emphasis on worker involvement in the introduction, planning and implementation of VDT-based "new technology." A similar conclusion was drawn by the British trade union ASTMS in its

analysis of 86 contracts negotiated in the insurance industry (ASTMS, 1983) ASTMS concluded that all VDT agreements covered type of equipment, its proposed uses, siting of the machines and the timing of their installation, as well as skills retention by workers and their training on how to operate the equipment.

VDT agreements also do not, on the whole, contain provisions for the training of workers' representatives or for the sharing of the benefits derived from increased productivity from the machines. The majority of contracts do include provisions for worker training, and access to outside experts by the Union. Information disclosure by the employer to the union, is also found in many contracts. However, neither consultation nor negotiation with the Union prior to the introduction of the screen-based equipment, nor the necessity of advance notification to the Union have been widely adopted. (This is again a similar finding to the ASTMS survey where only 19 out of 86 contracts provided for consultation with the union prior to change.)

Issues surrounding the hours of work have tended to concentrate on the maximum number of hours of VDT work and the frequency of scheduled workbreaks, rather than on the length of the entire workweek, as has occurred in new technology agreements in heavy industry.

An important provision of the majority of VDT contracts is the placing of limitations on the electronic monitoring of workers. That is, the extent to which an employer can keep extremely detailed records of keystrokes, error rates, time spent on and off the machine, and the extent to which the employer can use such data in personnel evaluation, has been strictly defined and limited. Additionally, many contracts provide some protection against job downgrading or loss through the introduction of the machines.

Some Additional Thoughts

It is interesting to note the rapidity with which basic ideas and principles of occupational safety and health have been incorporated into contracts governing work with video display terminals. What can account for this phenomenon? One explanation could be that the work is heavily dominated by women, who are in general believed to be more health conscious than men. The dominance by females, however, is not an adequate explanation since similar detailed safety and health clauses are not present in most contracts governing the working conditions in the health care industry, which is also characterized by many heavily female-dominated occupations. This discrepancy is particularly interesting since the potential for more

serious accidents and injuries in health care is far greater than the potential associated with VDTs (e.g. serious back injury, infection and exposures to drugs and chemicals).

Another explanation could be that the fear associated with totally new and foreign methods of operation and of equipment lead to an emphasis on health and prevention. Given the experiences in the past where serious occupational illnesses were discovered after the fact, such as in the widely publicized cases of asbestos and vinyl chloride, it is logical that workers and their unions would greet the machines with skepticism and distrust. Early reports of ionizing radiation leaks and of clusters of cataracts and of birth defects among VDT workers exacerbated the fears. In many cases, workers still are fearful.

A third explanation of this strong emphasis on health and safety could be that the achieving of better working conditions may have been perceived as among the only "options" open to the Unions. The rapid expansion of VDTs into the white collar workplace is commonly viewed as an inevitable, unstoppable event. Given the seeming inevitability of the change, the posture adopted by many bargaining agents throughout the world has been to make the introduction and use of VDTs as relatively painless and safe as possible, preserving those jobs that exist, and minimizing the physical impact of the machines on the workers who do them.

The lack of provisions for Union input for planning and the contrast to other basic "union rights" provisions negotiated for the introduction of new technology to heavier industries is also worthy of comment. There are at least two major reasons why this may have occurred, both related to the fact that the workers affected are largely women. It is a well-established historical and demographic fact that relatively small numbers of women belong to Unions and the organizing of women workers (and of white collar work, in general) has not been a major emphasis in the trade union movement until comparatively recently. This, of course, leads to a relative weakness in bargaining power for office workers, as well as a comparative lack of experience in negotiating union rights. Negotiating for specific changes in equipment and surroundings may have been all that was achievable, given the circumstances.

One must also consider the possibility that the need for job security and other benefits and strong union rights is simply not perceived of (either consciously or unconsciously) as important for women and hence has not been emphasized either by unions or managements in the negotiations for agreements. However, whatever

the current perceptions and attitudes, be they conscious or not, the issues are ones that will not simply go away. They will eventually have to be dealt with if the health, safety, dignity and productivity of the white collar workforce is to be preserved.

Chapter II

International Legislation and Governmental Guidelines

Examples of existing legislation covering the use of video display terminals in the workplace are discussed briefly in this chapter. The chapter represents an attempt to provide exhaustive coverage of legislation in force as of the end of 1986, but it is, of course, possible that some countries have been omitted here, or that new legislation and guidelines have been issued.

Australia

No federal laws for the installation and use of VDTs apply in Australia. However, an arbitration agreement reached by the Federated Clerks' Union of Australia (FCUA) and the Australian Civil Servants' Association concerns the proficiency and the functions of people employed as word processors and as supervisory staff for these workers. It provides for about an 8% pay raises in these job classifications. At the same time the arbitrator's decision stated that word processing (text processing in Australia) results in increased job satisfaction, since this work is "creative and demands both imagination and analytical discernment to a degree which far exceeds that required by more routine clerical work."

The significance of an arbitration decision in Australia is that under Australian law this decision will apply to all contracts within the industrial sector covered by the agreement. This is a contrast to arbitration agreements in the United States which apply only to the case under arbitration, although, of course, arbitration decisions can establish precedents which are considered in future decisions and contract settlements.

Guidelines on the use of VDTs have been issued by the Australian Working Environment Branch in the Department of Employment and Industrial Relations in 1983. These guidelines provide information about the "interface between people and the machines" and appears to be an attempt to show that VDTs can be used safely and how they can be successfully integrated into the workplace. The guidelines provide specific recommendations for the work station (i.e. the table, chairs and working height). Specific body angles and postures are given and in general conform to the model prescribed by the United States Occupational Safety and Health Administration, OSHA, which is reproduced in the Appendix. The guidelines also provide average dimensions and size distributions of males and females to be used in assessing work station design.

The document calls attention to existing Australian requirements for noise control and also warns that introduction of the terminals into already dry, overheated offices may lead to irritation, skin drying and feelings of itching and fatigue. Technical definitions of light and lighting are provided, together with a tabulation of recommended luminance ratios. Technical appendices on character specifications, visual task analysis and the interaction between the "technical environment" and the "social environment," as well as model workstations are included.

Austria

The Austrian Parliament adopted legislation on the health protection and safety of the approximately 70,000 workers on night shift or employed in "strenuous" work. Among the jobs classified as entailing strenuous work is continuous work with VDTs during the night shift. Among the entitlements of the law is additional paid leave (vacation), which is not compensable by a cash substitute, and an extra 10-minute paid break. According to the legislation, there are to be measures taken to prevent, alleviate, remove or compensate for stress. These measures must be carried out in consultation with the Works Council, the recognized body representing workers, with enforcement by arbitration if necessary. In workplaces with 50 or more workers employed on night shift, an occupational physician must be appointed. Employers are assessed additional social costs (a form of taxation) and health benefits for the VDT night workers, as well.

In 1982, an ordinance was issued by the Ministry of Social Affairs under an enabling provision contained in the Night Shift and Strenuous Work Act. This ordinance deals specifically with rest breaks for VDT workers. Under the Act, the labor inspectorate may order longer rest periods than those prescribed by the law itself, if this is necessitated by the arduous nature of the work or other factors affecting the health of the worker. These factors are considered to exist when working at a VDT work unit constitutes the essential part of the overall work performed. A VDT work station is defined as a screen, an input keyboard, its location, and the document holder. In this case, where work on a VDT is performed for 2 or more hours without interruption, a break of 10 minutes is to be credited toward the time worked. Such a break is to be included in each 50 minutes of continuous work. In other words, the law mandates work breaks.

Canada

Although the government of Canada has issued no formal guidelines on VDTs in the workplace, the *Report of the Labour Canada Task Force on Micro-*

electronics and Employment has issued a set of recommendations which include a "precautionary approach" to potential reproductive effects of VDT work and states that pregnant VDT operators have the right to request and to be granted reassignment to another position without loss of pay, seniority or benefits. It urges the establishment of health standards legislation by appropriate authorities which take into account the increased visual load. The Task Force recommends a "common sense" approach to occupational stress related problems of VDT operators, including taking into consideration the organization and content of the job and the physical and inter-personal conditions in which a person works, including management style.

The Province of Quebec has issued a set of guidelines for setting up and managing video display unit workstations. The principle factors which are to be taken into account are the lighting, the design of the terminal and the arrangement of the workstation. The guidelines presented are in conformity with the model given in Chapter II. In addition, a workstation checklist is included as a guide for management.

France

There are no specific regulations or laws that have been passed for VDT workplaces. However, two ordinances (*arretes*) include work at VDTs among the list of occupations requiring the intervention of the occupational medical specialist. (In France, the existence and duties of an occupational physician are specified by law.) The *arrete of 11 July 1977* includes VDT operators among the occupations which require the oversight of an occupational health physician. In addition, *circular number 10 of 29 April 1980* provides details on the general principles of surveillance for study of the workplace and for examination of individual workers. A methodologic guide has been issued by the Institute National de Recherche et de Securite (INRS), the French equivalent of the United States' National Institutes of Health, for the occupational physicians.

The INRS guidelines provide comprehensive guidance to the occupational health physician charged with overseeing the examination of VDT workers and of the work station. They incorporate recommendations formulated earlier by national technical committees (*ND 1359-105-81* and *ND 1498- 116-84*). The guidelines provide detailed review of the quality of the screen images and colors; lighting and visual comfort; physiological mechanisms of eye adaption; and principles of ergonomics. Specific recommendations include organization of work so that visually demanding tasks are alternated with less demanding ones. If this is not possible, continuous work

cannot continue beyond two hours without a pause of at least 15 minutes. The rest pause is to be taken at a location away from the VDT workstation.

A periodic examination, approximately every 5 years for those under 40 years of age, and every two years thereafter is recommended. It should comprise visual acuity and visual function, as well as color vision testing. The recommendations for the terminal itself and for the workstation are in conformity with the model given in Chapter II. The INRS recommendations also include a questionnaire on the nature and organization of the VDT work being done, potential visual problems and potential postural problems.

Federal Republic of Germany

The Federal Republic of Germany (West Germany) central government has established a set of safety regulations for VDT work. (*Safety Regulations for Display Workplaces in the Office Sector ZH1/618*) The regulations have a quasi-legal status insofar as they act as a commentary on the country's binding accident prevention legislation. The general rules and regulations are drawn up by the employer-financed Industry Injury Institutes, which are, in turn, jointly administered by the labor and management (whom the Germans refer to as 'social partners'). This regulatory structure is quite different from the structure to which Americans are accustomed, in that rules are not explicitly incorporated into extensive laws. Rather the system is based to a greater extent on guidelines and standards set up by standard-making bodies, akin, in a way to a Compliance Officers handbook but bearing far greater weight. The guidelines have direct financial implications, since adherence to them will affect insurance and compensation cost assessments.

The regulations cover technical screen specification, positioning, the keyboards, texts and document holders, worktables, chairs, eye examinations and worker training. At their outset these regulations set forth the 28 other standards which also apply to VDT work and include specifications for lighting, ventilation, minimum working space requirements and electrical safety. In addition, approximately 20 VDT related standards were in draft form in West Germany, as of 1986. They cover such subject areas as data display requirements. Additional physical factors to be considered and controlled in the workplace are also listed.

The bulk of the German regulations are devoted to detailed descriptions of the machine characteristics and the workspace, including character generation, keyboards, work documents, the document holder, office chairs, footrests, tables and space requirements, that are necessary for VDT work. Office illumination and the

ambient climate requirements, all in conformity with the model given in the Appendix, are also described.

Eye examinations are to be given every 5 years for people under 45 and every 3 years for those over. The regulations refer to yet another set of guidelines for the content of the eye examinations. The first examination is to be prior to beginning VDT work for the first time. Specifications and recommendations for adequate vision correction for VDT users are provided. There are guidelines for training of workers in the operation of the machines and with the basic principles of ergonomics which apply.

Co-Determination: The 1972 Works Constitution Act had established national industry-wide Works Councils for arriving at agreement over various aspects of "co-determination" among the social partners, industry, labor and government. The Federal Labor Tribunal has ruled, however, that Work Councils have no general right to co-determination regarding the layout of video display terminals workplaces. They may not demand time limits for work on VDT's, or paid work breaks, or prophylactic eye tests or a ban on VDT work for pregnant women. This ruling follows failure to reach agreement on the introduction of electronic data processing equipment, which a company claimed did not fall under the purview of Works Councils. The dispute had been brought before the Tribunal for resolution. (*Bundesarbeitsgericht: Ruling of 6 December 1983*)

One German State has issued a set of guidelines similar to the national safety regulations and contained in a small booklet which also provides background information. (*Bayerisches Staatsministerium für Arbeit und Sozialordnung "Arbeit mit dem Bildschirm -- aber richtig"*) The machine specifications, workstation and working posture are discussed in some detail in conformity with the model above. The eye examination is also described and applicable safety regulations that exist are cited.

Japan

There is no legislation for VDTs on the national level, however, the Ministry of Labor has issued standards for illumination, noise, air quality, temperature and humidity which apply to offices, and hence, to VDT work. Reference to these standards is made in a number of the guidelines described below.

The federal Ministry of Labor has guidelines issued that apply to VDT's in the office. Provisions include a statement of the desirability of worker training to alleviate initial difficulties which result from lack of familiarity with the new technology. Such training should be provided in accordance with the difficulty of the

work. The employer should also fully inform workers about safety and health and the various measures necessary for their protection and the improvement of their conditions.

It is recommended that VDT work be combined with non-VDT work and that employers plan and organize the work in such a way as to minimize the time spent looking at the VDT display screen as a way of preventing eye strain. In addition, a break of 10-15 minutes should follow each hour of continuous work. It is also recommended that short pauses occur during the hour and that exercises for relaxation be done during the breaks. Appropriate health examinations (eye and musculo-skeletal) prior to commencing VDT work and regularly thereafter are also recommended. The guidelines also recommend that employers ensure that equipment is designed with appropriate ergonomic features and criteria, in conformity with the model given in Chapter II, are provided. Guidance as to static electricity, noise, air, ventilation and room is also given.

Another set of guidelines has been formulated by the National Personnel Authority in 1984. These guidelines are provisional guidelines and cover environmental management, including illumination and prevention of glare, as well as ventilation, temperature, noise and static electricity. Some detail is also provided on the design of the VDT and associated equipment. The angle of viewing of the screen and the characteristics of the display are discussed. The frequency of rest pauses and the health examination recommended follow those of the Ministry of Labor, as do the guidelines for health education, which include understanding of the VDT and various preventive strategies.

Several municipalities have also issued guidelines as follows:

Jichi-sho 1985: These guidelines are very similar to those of the National Personnel Authority but do not specifically include provisions for eye and orthopedic examinations in their health management guidance.

Meguro Ward (Tokyo): These guidelines open with general principles, such as the need for flexible and appropriate management of health and safety. They stress the importance of supervisors being aware of health and safety and its relationship to appropriate work organization, such as assignment of tasks which avoid competition between workers. Workers must also be trained both for necessary skills and to gain knowledge about health and safety. Upon introduction of new equipment and systems, workers should be trained in order both to reduce the workload and to achieve safety and health. A detailed checklist is provided in the guidelines, together with specific guidance on safety and health, with an illustrated ergonomic work

station model. Detailed standards are also provided for environmental management of illumination, glare prevention, regular maintenance and performance checks, noise control and ventilation.

"Securing the peace of mind" of the workers is recommended in these guidelines. One way suggested for achieving this goal is through the appropriate placement of plants within the office. A maximum daily limit of 4 hours of VDT use is recommended, but for the 'time being', 3 hours is prescribed in the guidelines. Maximum continuous operation without a break should be limited to one hour, with a rest pause of 15 minutes. Rest breaks should also be taken by workers, according to how much fatigue they are experiencing and to their workload. The breaks should be used to relax the body. The breaks should require that work be interrupted and the worker should move around.

The environmental management guidelines also suggest that there should be sufficient space in the office for such movement during the workbreaks in accordance with the workload. In addition to this, the health management provisions recommend that there be a health examination every year, including symptomatic checkup and eye exam and that workers should exercise.

The guidelines also contain detailed technical appendices explaining lighting schemes, workstation layout, hours of work and the health examination.

Hokkaido 1985: These local government guidelines cover VDT work, the work environment and health management of VDT workers, as well as health education for them. The environmental management guidelines are similar to the other guidelines described here but they also include comparatively detailed recommendations on noise and noise control. (The prescribed levels are very low by all international standards: 60 decibels at the ear and 65 decibels at the printer, if the printer is located in the office).

According to the guidelines, all workers should have a health examination, including eye examination, prior to beginning VDT work and annually thereafter, if they have used a VDT for more than 50 hours or half of the days of a month in the previous year. There should be follow-up examinations where necessary. It is also provided that the examinations shall be at the expense of the national government.

Pregnant women and people with shoulder and arm pains should be medically proscribed from working with VDTs.

Only general guidance is given for the design of the VDT and its associated equipment, although it is specified that keyboard position should be such that the elbow can be kept at a right angle bend. A daily maximum of four hours of VDT

work is recommended, but for the time being it is recommended that VDT work be limited to three hours or less. A rest of 15 minutes should be taken after every hour of continuous work. Records should be kept of operating hours.

A person should be specifically designated as responsible for the maintenance of the VDTs and for dealing with the problems that may be brought up by the workers.

Sasebo City Office (Nagasaki-ken) 1985:

General terms of guidance and principles to be used in controlling work environment factors, such as the work station design, illumination and prevention of glare as well as some specifics, such as desk placement to lead to the elbow being held at a right angle while working, have been provided in these guidelines. It is also stated that there should be 10 - 15 minute rest pauses after one hour of continuous operation and that a light amount of exercise and/or focussing the eyes on a far distance. The prescribed health management includes an examination, with an emphasis on the eyes, two times per year.

The Netherlands

Regulations which apply to VDTs are contained within *The Netherlands Work Environment Act*, dated November 8, 1980. The Work Environment Act states that all workplaces, including, of course, VDT workplaces, should insure that safety, health and welfare at work are considered in the installation and application of equipment and working methods. Such installations should be consistent with the most up-to-date knowledge of ergonomics and industrial sociology, according to the Act.

In addition, to these general principles, there is a requirement for regular breaks where it is not possible for "work to be adapted to the worker." "In so far as can reasonably be required, the content of a worker's job must be so determined and the co-operation, management and supervision that the work involves be so arranged, that the work contributes to the worker's personal development and the improvement of his skills and that sufficient opportunities are provided for him to arrange the work in accordance with his own conception of it (as also determined by his skills), to maintain contact with other workers and to keep himself informed of the purpose and result of what he does and the requirements laid down for its performance."

The Act requires prior consultation with workers involved in processes where new technology is to be introduced, and that there be worker training as required by the *Dutch Works Councils Act* (the Dutch form of co-determination and industrial

democracy). In the matters of health and safety, work environment committees shall be established. The committees shall have access to outside expertise where needed. Medical and health services are also required, but no specifics for VDTs are included in the general Work Environment Act.

The Dutch government has also issued specific guidelines which were formulated by the *Dutch Cathode Ray Commission* in 1978. This official Work Study Commission's guidelines covered the design of the VDTs, their screen characteristics and the positioning of the VDTs in the workplace, as well as providing guidance on the workstations. Lighting requirements are also made.

The Guidelines note the necessity of maintaining ionizing radiation levels below 0.5 rem/hr (0.26 for those under 18 years of age), and, it is specifically noted that all current levels have been found to be below this level.

The necessity of avoiding eye fatigue was noted by the Commission, and it is recommended that not more than two consecutive hours be spent in front of the screen, at which time it is necessary to interrupt work with the VDT for a rest pause of 10 to 15 minutes. The Commission recommended eye examinations and has provided guidelines for the examinations and for the appropriate focal length to be used in prescribing corrective lenses, should they be required.

New Zealand

No specific laws for VDTs have been passed in New Zealand but other existing labor laws cover workplaces with VDTs. A *Code of Practice* covering work practice, the design and the installation of equipment used with VDTs has been issued by the New Zealand Department of Labour. This Code serves as recommendations and guidance to be used to achieve compliance with New Zealand's *Factories and Commercial Premises Act, 1981*. Such guidance is required by Section 50 of the Act.

The Code of Practice provides specific guidance on how to comply with the acts requirements for lighting, seating, atmospheric conditions (indoor air quality), ventilation and noise in workplaces with VDTs. Guidance for compliance with worker training and supervision requirements is also given. Such guidance is intended to be used for workers who operate VDTs for more than 4 hours per day.

The Code also provides definitions of technical terms that are applied to VDTs and for the health effects which have been associated with VDTs in the medical literature. The specific problems which are listed include: visual fatigue and symptoms of eye irritation, postural fatigue, tenosynovitis (inflammation of the

tendon or tendon sheath) in the wrist, photogenic epilepsy (rare likelihood of occurrence, according to the Commission), facial dermatitis, stress. The Code also states that emission of radiation has not been found in New Zealand surveys and is not considered either a long term or a short term risk.

The Code of Practice gives consideration to the distribution of work and recommends that short and frequent breaks be given to VDT operators before fatigue sets in. They may include breaks "away from the screen ... to carry out other clerical tasks associated with the operator's job." Adequate training "must be given" both on the use of the hardware and on potential problems and their solutions, such as optimum workstation layout. The consequences of not properly adjusting the equipment "must be explained to operators." References are appended to the Code.

In a legal situation similar to that in Australia, the Arbitration Court inserted new clauses into the New Zealand Insurance Workers Award on August 5, 1980. This is, in essence, a modification of a previous arbitration decision and thus establishes these clauses as mandatory on an industry-wide basis. They are "When an employer is considering the introduction of new computer technology (including word processing machines) the employees likely to be affected by any decision arising therefrom will be first advised.

"When an employer has decided to introduce such technology the employer concerned shall consult fully with the employees affected and the representative of the union. When the introduction of such technology will result in redundancies [layoffs resulting from job elimination], the employer concerned shall notify the union to enable discussions on redundancy to take place. ..."

An additional memorandum was issued on August 20, 1980, limiting the extent of union involvement. "While the Court realises that there is some attraction in the desire of the Federation of Labour to see that new technology be dealt with within the conciliation and arbitration procedures, as indicated earlier in this decision, the majority of this Court are of the view that the introduction of any new machinery or method into a work place is a decision for the employer. ...[but] "He would be a foolish employer who, in the present circumstances, did not consult with the union where there was any possibility of a worker being adversely affected, either by status of job or by loss of job."

Sweden

Sweden is the only country with regulations covering broad aspects of VDT work. The regulations were passed in June 18, 1985 by the National Swedish Board

of Occupational Safety and Health, pursuant to Section 18 of the national *Work Environment Ordinance*, into which it was incorporated. It provides for "readability" of VDT screen; ambient light not impeding screen reading and for task lighting where needed. The regulations require adjustable work height for the keyboard and screen angle. Adequate work surfaces are necessary.

Vision tests are to be administered, and, if indicated, special glasses specifically corrected for VDT viewing distances and conditions are to be prescribed and provided. Task rotation to relieve eye and other strain is required.

The Swedish law pays some attention to the nature of VDT work. The law states that work with VDTs "involving severe control or constraint or monotonous routine work shall be avoided or restricted." Technical details for implementing these provisions are given in an appended background and purposes section of the ordinance.

Sweden has earlier passed a *VDU Reading Directive in 1978*. This directive was pursuant to the Workers' Protection Act. The Directive clearly notes that no permanent damage nor deleterious radiation exposures have been associated with VDTs but that reading can be "tiring" to many people. In order to avoid such effects the general lighting must be reduced and additional task lighting available. All lighting sources should be designed to safeguard against glare. Viewing distances and angles should be individually adjustable and special glasses may be needed if screen adjustment does not modify the visual problems. "If a tendency towards eye fatigue or visual difficulty becomes apparent, work must be arranged in such a way that the employee alternately receives rest intermissions or work involving more conventional visual requirements."

Switzerland

No national regulations exist, however, the *National Accident Insurance Organization* has issued a very comprehensive set of ergonomic guidelines for work with VDTs. The guidelines are in general conformity with the model presented above. The recommendations of this group are important from a policy perspective because it represents the major carriers of workers' compensation insurance.

The recommendations also address the medical management of the VDT worker and considers rest pauses to be a part of medical management. While not specifying general rules, because of a stated need for management flexibility, the guidelines recommend that frequent short pauses are more effective than long one. It is noted that in many businesses, 5 to 10 minutes breaks each hour or 10-15 minute

breaks each two hours are afforded to workers. Regular eye examinations for workers with normal vision are not considered necessary, whereas workers with visual defects should be examined and may need special corrective lenses adapted to the VDT work. Bifocals are not recommended.

Exercises, particularly for the upper torso are recommended, as is an organization of work that lends itself to a variety of tasks. The guidance also provide some information on aspects of work that relate to monotony, anxiety and job satisfaction.

In addition, *Canton of Geneva* has issued recommendations in 1982 covering work with VDTs. The recommendations include consideration of the lighting conditions, the location of the equipment in the workplace, the technical characteristics of the machine and its adjustability. These are in conformity with the model in the Appendix. The recommendations also state that, at a minimum, there should be a rest pause of 15 minutes every two hours and, where the VDT work is intensive, a maximum of four hours should be spent at the terminal, with the remainder of the day devoted to other activities.

The recommendations include additional technical information and some pitfalls to avoid in the purchase and set up of a VDT.

United States

No federal legislation specifically for VDTs exists in the United States. The Occupational Safety and Health Administration, OSHA, has also issued information on appropriate use of VDTS (*Working Safely with Video Display Terminals, Publication #3092*). OSHA has no standards that apply specifically to VDTs. However, OSHA does require employers to protect employees against overexposures to radiation, noise and electrical hazards. The contents of this manual appear in the Appendix. Given the recent ruling of the U.S. Supreme Court on the obligation to adhere to the 'general duty' of providing a workplace generally regarded as safe, whether or not the same specific standard exists for the working conditions involved, it could be argued that OSHA has set forth the criteria which define the general duties of employers with VDTs in their workplaces. This interpretation has not yet been field tested.

Several States have promulgated legislation that applies to VDTs. The *State of Maine*, which previously had no rest break entitlements for workers, now requires employers to allow employees 30-minute rest breaks per six hours worked, which also applies to VDT operators. (Legislative Document 1471, May 28th 1985)

The Governor of *New Mexico* has signed an Executive Order which applies only to state workers (approximately 25% of the State population). It entails a series of environmental and workpractices recommendations, including reduced general room lighting and task lighting; effective glare control; eye examinations (at operators' expense); ergonomic equipment and machine; noise reduction. The recommendations are to be taken into consideration to the greatest extent feasible in the purchase and use of new equipment. (New Mexico: Executive Order 85-11, March 27, 1985) An oversight committee has also been established.

In *Rhode Island* the state Department of Labor is required to produce a brochure on the proper use of VDTs in the workplace and to conduct workshops and training sessions based on the information in the brochure. (Rhode Island: Act 85-H6097, enacted May 29, 1985)

Guidelines for appropriate use of VDTs have been formulated at the federal level. The National Institute for Occupational Safety and Health (NIOSH, 1981) has issued the following general recommendations:

- *Workstation design shall emphasize adjustability of viewing distances, viewing angle, top and bottom edge of screen. Keyboard factors, within the typical range given in the model, are also recommended. Adjustable chair height and chairs with backrests are recommended;

- *Illumination and glare control consistent with model are recommended;

- *Work-rest regimens of 15 minutes pause after two hours of continuous work when the work entails moderate visual load are recommended by NIOSH. The pause should be taken after one hour of if the work is highly visually demanding or highly repetitive work;

- *Visual testing should be given to VDT workers and should minimally include a comprehensive pre-placement vision exam following American Optometric Association other guidelines (see below) to be repeated as needed.

CHAPTER III

SELECTED EXAMPLES OF COLLECTIVE BARGAINING AGREEMENTS AND ASSOCIATION GUIDELINES GOVERNING THE USE OF VDTS AT WORK

The collective bargaining agreements that are described here are representative of the *types* of agreements that have been concluded and the conditions of work which have been negotiated. Because those contracts which go into detail about lighting, chair and worktable design, VDT design and other ergonomic aspects basically cover the same principles of design, the specific details are not included here. Rather, it is stated that specifications in conformity with the model have been negotiated and the reader is referred to the OSHA specifications, given in the Appendix, for a general model of appropriate ergonomic design in the VDT workplace. It should be noted that the contracts described here do not represent an exhaustive compilation of every agreement negotiated which governs the use of video display terminals in the workplace. It should also be noted that in the United States, comparatively few workers in the clerical and service professions where routine, and possible monotonous use of VDTs is widespread, are covered by collective agreements or belong to trade unions. This is in direct contrast to most countries of Western Europe, and to a lesser extent, to Canada.

Australia

The agreement between the *State Bank of Australia* and the *Australian Bank Employees Union, ABEU* (1984) is one of the most detailed of collective agreements about labor-management issues and the health and safety aspects of work with screen-based equipment. In-depth details on characteristics of the machine are included and some examples of the technical illustrations from the agreement are given on the following pages. Detailed conformity with the model, as specified in the OSHA guidelines, is agreed to.

The contract also includes definitions of work and health and well-being objectives. It requires assessment by outside consultations and requires that the union be consulted on most aspects of VDT work. Older equipment is to be specifically included in assessments of health and safety, and is to be brought up to contemporary standards for health.

Design of work provisions include: 10 minute rest breaks each 50 minutes for 'continuous' users. The breaks are to be accomplished through the allocation of normally scheduled breaks. There is to be no monitoring of keystroke rates on an individual basis, in order to avoid operator stress, but keystroke rates on a group productivity basis can be calculated. There is to be no introduction of bonus or incentive payments based on keystroke rates. Breaks and exercise programs cannot be altered to meet deadline pressures.

With regard to health, there is to be worker training to prevent injury. 'Continuous' users are to have their visual acuity and function tested annually, with exams and corrective appliances supplied at the employer's expense; part-time users are to be tested less frequently. Pregnant employees have the right to request transfer and the Bank will attempt to accommodate the request. As a health consideration, the Bank will exempt from shift work, to the extent feasible, any worker not desiring to undertake it. Both sides support the concept of epidemiological research and will cooperate with it.

There shall be regular equipment maintenance and inspection, including a radiation check on a random sub-sample of the VDTs. Records are to be kept of the maintenance.

Canada

In one of the earliest agreements related to VDTs, *Bell Canada* and the *Communications Workers of Canada* concluded a separate "Video Display Terminal Agreement" relating to pregnant workers provides for pregnant workers to exercise one of two options: leave without pay until maternity leave eligibility; re-assignment to another job in the bargaining unit provided such work is available.

According to a union communication to its members, both the union and the employer recognize this agreement as a temporary measure until more data is available. It was also adopted as a precautionary measure and not because an effect of VDTs has been established.

Since the time of the Bell Canada agreement, other broader collective agreements have been negotiated, to a large extent covering workers in the private sector. The agreement between the *Ontario Provincial Service Employees Union (OPSEU)* and the *Province of Ontario Civil Service* in 1983, governing some 50,000 workers who use VDTs, is representative of the trend in Canadian VDT bargaining. The agreement includes a 10 minute workbreak after one hour of continuous VDT

GOOD WORKSTATION PRINCIPLES

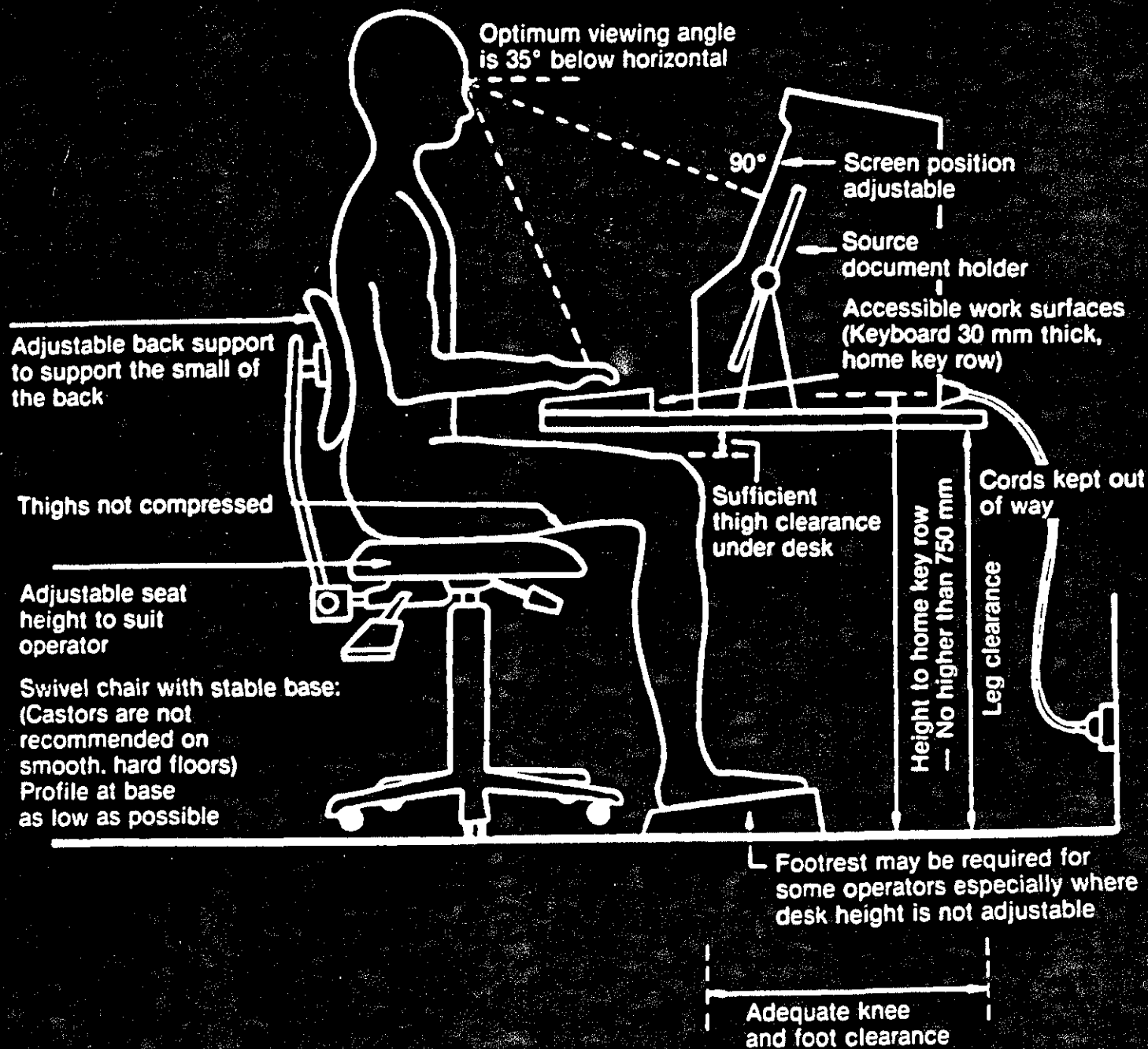


ILLUSTRATION I: Australian Bank and Employees Union and The State Bank of Victoria

DIAGRAM OF CHARACTER LAYOUTS

Minimum character height

15 — 20' of arc

3.5 — 4.2 mm

Stroke to height ratio

1/8 to 1/6

Width to height ratio

3/4 — 4/5

Minimum number of raster lines

10 lines

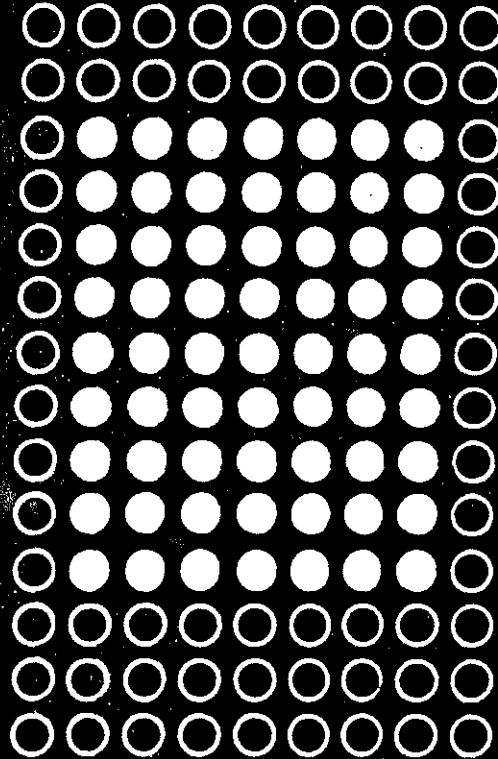
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Cell Height (14 dots)

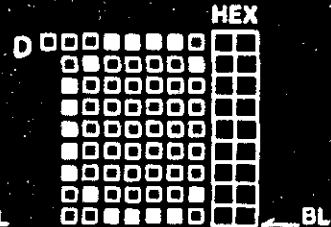
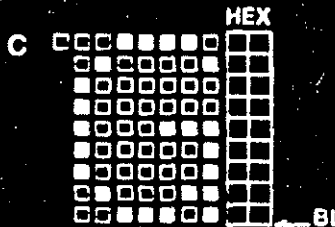
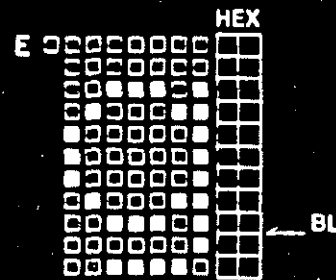
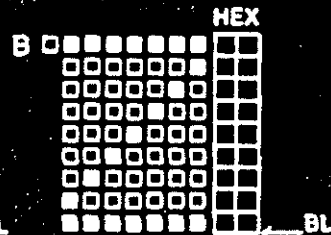
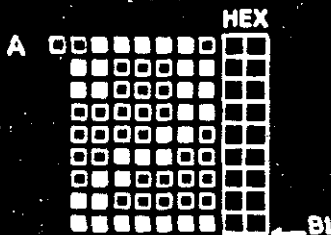
Character Width
(7 dots = 2.54 mm)

Cell Width (9 dots)

Used for
lower case
descenders



Examples



BL = Base Line

ILLUSTRATION II: Australian Bank and Employees Union and The State Bank of Victoria

use. There are to be a preplacement and annual eye examinations. If corrective lenses are needed for the VDT work, these glasses are to be provided under the VDT eye care plan. Pregnancy transfers for VDT operators have been agreed upon, if the worker desires it. If work is not available in the worker's class, it must be found at the closest class and payrate. If this is not available, early maternity leave will be available and the worker covered by unemployment insurance. OPSEU has concluded a similar agreement with the *College of Applied and Technical Arts* support staff.

Federal Republic of Germany (West Germany)

In Germany, the trade union movement is quite powerful and, as a result, workers have many rights that are legislatively guaranteed to them. A large percentage of German workers are represented by unions. One example of social legislation granting power to the labor movement are the Works Councils, institutional bodies representing labor interests at work enterprises which must be consulted on many aspects of working conditions. The subject of VDTs has, however, received less attention, as discussed in Chapter I, than other technological changes in the German workplace by the Works Council system.

An agreement *Deere and Company* and its union illustrates the role of the Union, which is to be advised by management at the planning stages and continuously thereafter about management's plans for VDTs. The role of the Works Council in current and future stages of implementation of VDT-based work is also spelled out in the agreement. Working conditions are to be addressed by a special VDT committee which will establish guidelines based on state-of-the-art knowledge. At the request of either party the Committee will provide guidance on disputed issues for the Works Council and management who shall reach the final decision.

Specific technical working conditions are to be based on the relevant national Safety Regulations. In addition, adequate consideration must be given to task variation and mixed work assignments and there was agreement that there should be a maximum of 2 hours continuous usage and 4 hour daily usage of VDTs. The fifteen minute pause after two hour periods can be used for other work but the preferences of the workers should be taken into account. Workers shall be given necessary training and computerized evaluation of performance is only permitted with agree of the Works Council.

Prior to beginning VDT work, an ophthalmologic examination and certification of the worker must be performed during working hours. If special corrective lenses are needed, they are to be provided at the employer's expense. Examinations should be repeated every 5 and 3 years, for people under and over age 45, respectively.

Agreements between the Federations of German *Magazine Publishers* and of *Newspaper Publishers* (1978) and the Federations representing workers in the printing, journalism and other national unions, contains a number of provisions on job security, redeployment procedures, if necessary, re-training, salary maintenance and other matters that pertain to the introduction of new technology, like VDTs. Many of these provisions are already part of the social legislation and industrial practices of West Germany.

The contract also specifies technical requirements for the design and function of the VDT itself. Again, these design criteria are already specified by the standards making body, DIN. There is to be medical surveillance and eye examinations of VDT workers. If working with VDTs are 'intolerable strains' for some workers, they shall be transferred to another position, where other work is available. The contract specifies that computer monitoring of worker performance is not to be carried out.

The contract between a major manufacturer of *Industrial Parts* and the *Industrial Works Council* (1982) defines what the statutory roles of advice and consultation for the works council are to be with regard to VDTs. According to the contract, the Council must be provided with all necessary information on the VDTs in order to fulfill its social role and must be consulted on the personnel, the social and the organization of work aspects of VDT work before the installation of the equipment and also as the process proceeds. The workers are also to be informed and trained about all technical and organizational aspects of VDT work and their concerns are to be taken into consideration. The agreement includes job protection and job grade protection provisions in cases where redeployment or other personnel modifications are needed. It limits the use of electronic data for process evaluation and forbids the use of data for personnel monitoring without explicit agreement of the Works Council. All access to such personal data must be strictly controlled.

Working conditions are to meet, at a minimum, the federal rules described in Chapter I (ZH 1/618). In addition, the organization of the VDT work is to be designed to minimize monotony and maximize job and task variety. A five minute

rest pause every one hour fifteen minutes must be given for VDT work which is longer than 2 continuous hours. This time can be used for other non-visually taxing tasks. The breaks, however, cannot be combined, nor taken at the beginning or end of the day.

Eye tests and appropriate corrections when needed are to be given according to Insurance Institute (Berufsgenossenschaft) regulations, at the company's expense. It should be noted that while these recommendations do not hold the force of law, recommendations by the Insurance Institute, a kind of workers' compensation body, generally define industrial practice. Workers who have been found medically incapable of VDT work cannot be dismissed on this basis.

An agreement reached in the insurance industry (*Volksfürsorge* and the *Trade Union for Trade, Banks and Insurance Sector, GHBV*) in 1979 specifically covers employees who use VDTs and provides pre-placement eye examinations, at the employer's expense and by an employer selected physician. The examination is to be repeated one year after work begins and every two years thereafter, unless the employee feels that his or her health is deteriorating. The employee can then request additional examinations.

Workplace layout shall be according to best current technical knowledge and a fifteen minute break shall be allowed after every hour of continuous VDT work. These breaks shall include already existing ones. The maximum time to be spent at VDT work, including breaks, is six and one-half hours. Wherever possible, tasks will be varied and composite jobs planned. Pregnant women shall not be employed in VDT work.

Employees shall not be monitored electronically. The advice of the Works Council shall be taken into account in all staffing and personnel matters .

The agreement between the *Federal Postal Service* and the union representing postal workers, *DPG* (1981) covers work at video display terminals and formally agrees that the postal services must comply with existing standards (ZH 1/618). The agreement also specifically incorporates the eye examinations provisions that are set out in the DIN standards.

All workers in the postal service shall receive training in the equipment and in appropriate ergonomic adjustments that they are to make (e.g. adjusting chair backs and heights) for maximum comfort and performance. Workers whose job regularly

requires more than 2 hours of continuous VDT work shall be given breaks of 10 minutes each hour. The breaks cannot be combined nor taken at the end of the day.

The agreement states that, where possible, jobs with different tasks may be designed. Job protection provisions have also been negotiated.

France

In France, the protocol for a major set of agreements in the *banking industries* was signed by the union representing workers in this sector of the economy and the federation representing the bankers (1983). The protocol specifically governs the conditions of work involving VDTs. It opens by formally citing the laws of France that pertain to VDTs and that are discussed in Chapter I. The rights and responsibilities of the health and safety committees in the workplace are also reiterated in the protocol. General principles for lighting and the quality of light in the working environment are described, as are the appropriate seating arrangements, and the nature and duration of work at the terminals. The protocol does not set out hard and fast rules that must be obeyed, but rather describes different conditions and the kinds of breaks they might require. The protocol specifically states that the task variation and pauses are to be determined at the individual worksites.

Japan

The labor union structure of Japan differs from the structure of most unions in most Western countries. Membership in unions is, in general, defined by employment at a specific workplace. Thus workers employed by the SONY Corporation would be considered members of the SONY workers trade union, as one example. A few sample contracts follow.

Kawasaki City and its Union (1984): This memorandum of agreement covers all the civil servants of Kawasaki city who engage in VDT work. VDT work shall "in principle" not exceed 4 hours per day and a rest pause of 15 minutes should be taken every hour. Specific recommendations for prevention of glare and room illumination are included, as is the necessity for ergonomic consideration for workstation adjustability. Ophthalmological and orthopedic examinations should be given. There is provision for labor-management consultation with regard to questions arising from the memorandum.

Maikata City and its Union (1984): The agreement opens with the principle that there should not be deterioration of the workplace, the memorandum of agreement provides for health management through regular eye examinations.

Efforts shall be made to accommodate pregnant women requesting transfer and workers with strong myopia who request to be relieved from VDT work. Training shall be provided on the equipment, including safety and health aspects of VDT work.

The organization of work is to include a 4 hour daily maximum for VDT use, with 60 minutes the maximum for continuous operation, after which a 15 minute rest pause is to be taken. Section chiefs are to give adequate consideration toward appropriate distribution of VDT work among the workers. The general work environment (light, temperature, noise, placement of equipment and illumination) is to be considered and regular maintenance of equipment carried out. When equipment is introduced or changes, labor-management consultation shall take place in advance of the change.

ID cards and passwords for computer use shall be issued, but the data that can be gathered on individual workers shall be protected and not be used for labor-management purposes.

A separate agreement shall be made, based upon this agreement, for word processing and personal computers.

Sanin Broadcasting Company and its Trade Union (1984): This is a collective agreement specifically concerning VDT work. It covers the work environment, the health of workers and the management of the VDT work. There is extensive description of the illumination, glare reduction measures, appropriate temperature and ventilation. Desks, chairs and the distance and angle of placement of the equipment are described. There is to be a rest pause of 10-15 minutes after every 60 minutes of operation of VDTs, with a maximum daily VDT use of 5 hours.

The provisions for health management are for semi-annual checkups, with an emphasis on the eyes, hands and arms. Follow-up of symptoms attributed to VDT work can include reassignment, a reduction of hours of work on the VDT or other appropriate measures aimed at maintenance of health. Pregnant women are prohibited from VDT work. Calisthenics shall be done at 3 PM in addition to a few minutes of exercise every morning and afternoon.

In the event that problems arise, there shall be labor-management consultation. The agreement also contains notes to the effect that the company wanted a review after one year but the union insisted on six months, which was

agreed upon. In addition, it was noted that the union had insisted on a four hour maximum but the company had wanted five.

New Zealand

One agreement covering VDTs for workers in New Zealand is between *Air New Zealand* and the *New Zealand Federated Clerical, Administrative, and Related Workers Industrial Association of Workers* (1981). The agreement contains provisions on staff training, health and safety aspects of working with VDTs, and environmental standards that are to be maintained. The union is to be informed and consulted about these conditions, and where needed, independent advisers acceptable to both sides are to be brought in. Rest pauses are to be given for five minutes every 30 minutes, or 10 minutes every hour.

The VDTs are to be maintained and serviced regularly. They are to be tested to insure that they meet international standards for radiation safety. Detailed specifications, similar to those of the OSHA model given earlier, are laid out, as are detailed specifications for environmental and ergonomic factors of the work stations. The temperature, humidity, lighting and ventilation are all addressed and minimum standards are set. There are anti-static electricity provisions included in the contract.

Workers are to be given training on the technical skills required for VDT work and on the health and safety issues that are associated with it. If some workers are unsuitable for the VDT work or become surplus because of automation, a plan for redeployment of personnel is spelled out.

A private sector agreement between *Todd Motors Ltd.* and the *Wellington Clerical Union* (1982) also included provisions against job loss from automation. It was agreed that current clerical levels of staffing would be maintained and provisions for reassignment were spelled out. As to the health and safety aspects of VDT work, eye examinations are to be provided before work begins on the VDT and semi-annually thereafter. The examinations and any necessary corrections for VDT work are to be at the company's expense.

The workers at Todd are to get rest pauses similar to the workers at New Zealand Airlines (above). The equipment is to be kept in good repair and a mutually acceptable independent adviser is to be hired for inspection and advise. This procedure is to be repeated each time new hardware is introduced and the company is to act on the recommendations following the inspections.

United Kingdom

Contractual agreements have been negotiated widely in the United Kingdom with regard to VDTs. They follow a pattern, in general reflective of Great Britain's Health and Safety Executive, the equivalent of OSHA in the United States and also afford the unions a great deal of consultative and informational rights. A few examples are set forth here.

For example, the collective agreement between the *Automobile Association* and the *Association of Professional, Clerical, Executive and Computer Staff, APEX*, (1981) contains consultation and advance notice provisions on employment, training, job evaluation, health and safety (including workplace design) and trials and pilot schemes covering all aspects of VDT work. The agreement emphasizes that efforts will be made to reduce the impact on level of employment and to use existing workforce rather than recruit externally. Existing staff will be trained in any new working practices or retrained for deployment in other areas.

As a matter of working principle the employer intends to conform to Health and Safety Executive recommendations. In addition, continuous VDT users, which here is defined to be people who use the VDTs for more than 2 hours per day, will be provided with initial eye exams and then re-examined every three years thereafter. Corrective devices are at employee's expense. Breaks will be afforded every 2 hours and are to last for 10 minutes.

A public sector agreement between the *Bolton Health Authority* and the trade unions with which it works, (1982) incorporates a general approach to new technology (redeployment of personnel, consultation with the unions and advance notice to them of technological change). No specifics for VDT's are given but the advice and recommendations of the Health and Safety Executive will be sought, according to the agreement. The Occupational Health Service will "medically screen" workers prior to their use of the new equipment.

The *Brush Electrical Machine Company* and *ASTMS*, the large union called the *Association of Scientific, Technical and Managerial Staffs*, which is extremely active in workplace health and safety, signed an agreement (1982) which emphasizes a "spirit" of cooperation and mutual rights and responsibilities in the area of new technology. The union has the right to consultation at all stages and management will endeavor to limit job loss to the greatest extent feasible. Appropriate training will be given to workers as required by the technology and during normal working hours. "All necessary precautions will be taken in the siting and location of equipment to

avoid health and safety hazards... [and] equipment will be maintained to comply with health and safety standards."

United States

The great majority of workers in the United States who use VDTs for clerical or service tasks are not covered by collective agreements since they do not belong to unions. However, among some unions who do represent substantial numbers of VDT users, there has been a significant effort toward securing specific clauses in the collective agreement that deal with VDTs. A few examples, which illustrate the trends of the bargaining, follow.

The *City of Boston* and *Service Employees International Union, SEIU* (1984) agreed to the establishment of a joint labor-management health and safety Committee which has the right to discuss health and safety aspects of work with VDTs. The Union is to be consulted on the impact of VDTs and on the implementation of the new technology on the job. The Union is also to be notified of changes in technology. No wage reduction is to occur from introduction of new technology into a job classification and training is to be provided to workers prior to their work with new technology. The training is to include health and safety precautions. Insofar as possible VDT work is to be rotated and to include various forms of new technology. Consistent with existing rest periods, VDT operators required to take a 15 minute pause after 2 hours work of VDT work.

New equipment shall conform to "industry standards". Cleaning materials and regular maintenance, including radiation monitoring, are to be provided to the employees and workers will have access to the maintenance records. Ergonomic considerations for workstation with emphasis of properly lighted environment are to be taken. Transfer options for pregnant workers to comparable jobs is to be available.

In an agreement between *Boston University* and the *United Auto Workers, UAW* (1983), the University agreed to inform the union about published health and safety information and about machine maintenance. The University will also inform departments about the University's advisory guidelines on installation and use of VDTs. The characteristics of the machines, where they are to be placed, and adjustment of general lighting to minimize eyestrain, are other negotiated clauses of the agreement. "Reasonable" efforts are to be made by the University to ensure that appropriate work station design is used in the separate departments. Although the

University believes no reproductive hazard has been established, the University will attempt to reassign pregnant workers upon request, or will permit leave under current University leave policies. Eye examinations, with "VDT-specific eye tests" are to be developed and required for all employees using VDTs for more than 45% of the time. Tests to be given by University appointed professionals.

Another University, the *University of New Haven* and *District 925* (1984) have agreed to a joint Health and Safety Committee which will be empowered to establish guidelines for radiation, lighting, workstation design and eye exams for VDT users. No cost items are to be implemented immediately. A \$15,000 pool was established for implementation of cost items during the first year of contract.

Workers are to be given rest pauses of 10 minutes of non-VDT work after 50 minutes of continuous VDT work. Pregnant employees requesting transfer will be accommodated insofar as possible.

The *State of California* and the *SEIU* (1985) have signed a memorandum of agreement whereby the State (where possible) will order equipment based on recommendations of a Joint Labor/Management VDT Committee Report. Instructions on operation and proper ergonomic adjustment of VDTs are to be provided by the State to workers. The Union will encourage its members to follow proper procedures while working. Specific action is to be taken to reduce glare, including rearranging the workstation and installing anti-glare devices on the VDTs. The memorandum contains detailed guidelines on machine and keyboard characteristics, character generation and ergonomic furnishings.

The *City of Berkeley, California* has signed an agreement with the *SEIU* (1984) whereby the Union is to be given 90 days notice of new technology which will have a direct impact on the city's employees which it represents. Representatives of the City will meet and confer with the Union about these changes and training will be provided, wherever possible, to qualify employees for new technology. Work environments shall "avoid excessive noise, crowding, contact with fumes and other unhealthy conditions." Wherever practicable the flow of work shall be controlled to avoid long, uninterrupted use of VDTs. Requests for transfer for pregnant employees will be accommodated provided that employee is qualified and other positions are vacant. Any such position held by a temporary employee can be used for transfer. If positions are traded by two employees, both must be competent in new assignments.

The *City of San Francisco* has signed a similar agreement with *SEIU (985)* whereby a joint labor-management City Safety Committee is to be established for consultation. The work environment shall "avoid excessive noise, crowding, contact with fumes and other unhealthy conditions." Wherever practicable the flow of work shall be controlled to avoid long, uninterrupted use of VDTs. a 15 minute break is to be taken after 2 hours of work. If the break cannot be accomodated by the normal lunch and work break schedule, alternative non-VDT work shall be assigned for 15 minutes.

The Union is to be consulted on machine design features including separate keyboards, tiltable screens, phosphor colours, and brightness controls, prior to tp their purchase. Glare screens are to be provided where necessary. Other negotiated work environment features include adjustable chairs, footrests, tables, and optimal adaptable lighting.

The current VDT eye examination program was to be reviewed and the right to transfer to non-VDT job during pregnancy was agreed upon. Where necessary, good faith effort shall be made for those requiring "light duty" away from VDTs.

In the first contract negotiated between a major insurance company and a union, the *Equitable Insurance Company* and *District 925 (1984)* agreed that sixty (60) days advance notice for technological changes with employee impact was to be given to the Union. Appropriate training on new equipment is also to be provided. The size of the bargaining unit is to be maintained at the level it was prior to when the worksite was successfully organized by the Union and the signing of contract. A labor management committee, with equal representation from each side, is to meet during working hours, with committee members receiving full pay. The Committee will consult on health and safety matters. The impact of the new technology on workers to be major agenda item for the committee. At least one management representative shall have authority over the area in the office being considered. Workers have the right to information about computer monitoring and access to the records on their own productivity. They have the right to object to the contents of the records and to pursue their objections according to the contractual grievance procedures. Some protection against speedup based on the monitoring data os also provided.

The contract specifies that the VDT environment is to be designed to minimize worker exposure to "heat and possible radiation." VDTs are to have

characteristics which include non-glare screens, adjustable contrast, and detachable keyboards. Other work station components, like chairs, footrests, and glare reduction arrangements, machine maintenance and cleaning, are also specified.

In addition to the 15 minute morning break available to all workers, VDT operators will have a 15 minute alternative work break. The health provisions of the agreement include eye examinations and eye care in accordance with the company's health plan. Workers have a right to transfer to telephone-based work during pregnancy. Pregnant workers who believe that work with VDTs is unsafe and who cannot be given other work will be considered on voluntary layoff.

In contrast to the extensive coverage of VDT working conditions of the Equitable - District 925 contract, the agreement between *Kaiser Permanente* and the *SEIU* (1984) is very limited. The employers has agreed to provide information to the union and to keep itself informed of, and consider information and recommended guidelines, such as NIOSH with regard to VDTs. Kaiser Permanente, which is a health care delivery organization, has agreed that "...the Employer will allow employees predominantly using VDTs to periodically move about."

Pregnant employees may request transfer (although the employer states that "there is currently no medical evidence" of harm). Transfer is to use the normal transfer procedures. Eye examinations and lenses covered under the company's benefit plan are to be afforded VDT operators, and if additional change is required within 12 months, the costs of such new corrections are to be borne by the Employer.

The *Newspaper Guild* has been one of the unions most active for the longest period of time on the issue of the introduction of VDTs into the workplace. The Guild amended its mandatory bargaining program of proposals to be presented during negotiations to include the right for pregnant employees to transfer from non-VDT based jobs; mandatory protection against extremely low frequency non-ionizing radiation through shielding of the flyback transformer and shielding of the VDT itself. Employers are to provide at least two radiation tests during the period of the contract. Periodic eye examinations and corrective lenses, if needed, are to be provided and paid by the employer. The mandatory program also requires that hourly rest breaks be sought and that there be no VDT use during the last hour on the job. Adjustable chairs, desks and footrests are to be provided. Studies of lighting in the workplace are to be carried out by a Guild approved expert. There should be consultation with the Guild prior to installation of VDTS, according to the bargaining

program. The success of the Guild in implementing this program, of course, varies from contract to contract.

One agreement signed by the *Newspaper Guild* and *Time Magazine* (1984) stipulated that a joint committee be established to monitor VDT safety and to recommend changes and educational programs about safety. The Publisher shall post such information for the employees and no employee will be required to operate equipment continuously without a break.

Two machine inspections, during peak production, are to be carried out. The Union is to be consulted about the inspection protocol prior to its executive. The inspections shall be carried out after prior notification of Union. Noise levels will be kept below 85 decibels in the workplace.

A joint list of physicals or medical facilities for annual examinations shall be provided and Publisher shall provide a \$60 subsidy toward the examination. Pregnant employees may request transfer which Publisher will apply good faith in facilitating. If no other work available, a pregnancy leave will be considered within current leave policy.

A small independent union has negotiated an agreement (*Wisconsin Bank* and *FWNBEA* 1983) which also includes VDT provisions. Anti-glare screens, "proper" desks and chairs, as well as yearly free eye examinations are to be provided for VDT terminal users.

Working Safely with Video Display Terminals



APPENDIX

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U.S. Department of Labor
William E. Brock, Secretary

Occupational Safety and Health Administration
Patrick R. Tyson, Acting Assistant Secretary
1986

OSHA 3092

Introduction

The Occupational Safety and Health Administration (OSHA) is often asked about possible safety and health problems associated with video display terminals (VDTs). Some concerns include high voltage electricity, ergonomics and noise. But the greatest interest is in whether radiation emitted by VDTs poses any problem, particularly to pregnant women.

OSHA has no standards that apply specifically to video display terminals. However, OSHA does require employers to protect employees against overexposures to radiation, noise and electrical hazards.

Radiation

The National Institute for Occupational Safety and Health (NIOSH), the U.S. Army Environmental Hygiene Agency and others have measured radiation emitted by VDTs. The tests show that levels for all types of radiation are below those allowed in current standards. In fact, some measurements show radiation levels so low that they cannot be distinguished from general environmental radiation (background radiation).

Currently, OSHA has no reliable information that any birth defect has ever resulted from a pregnant woman working at a video display terminal. However, the possible effects of radiation from VDTs on pregnancies continue to concern employees. Therefore, NIOSH and others are currently conducting major studies to thoroughly investigate any potential problems.

Noise and Electrical Hazards

It is unlikely that noise exposures in a typical office setting, even in an office with a pool of VDTs, would exceed OSHA standards. However, a cluster of high-speed printers without sound screens could produce some questionable noise levels.

If background noise is too loud, employees will be under stress and information may be garbled or drowned out completely. However, people find it difficult to work in a completely silent room. Some background noise is natural—the rustle of paper, the hum of machines, conversations down the hall.

Noise levels should be kept within comfortable limits. Sound sources that are unacceptably noisy should be shielded by sound absorbent screens or hoods or placed in a separate room. Unwanted distraction can be reduced in an office environment by well-placed absorbent materials such as acoustical ceiling tile, carpets, curtains and upholstery.

OSHA has a number of electrical requirements applicable to VDTs. The equipment must be properly installed, used and grounded to ensure employee safety.

Physical Discomforts

Video display operators do sometimes report eye fatigue and irritation, blurred vision, headaches, dizziness, and pain or stiffness in the neck, shoulders, back, arms, wrists and hands. However, these problems have not been determined to be related to radiation. Rather they involve ergonomics—the physical and environmental setting where the VDT users work. The relation of the operator to the keyboard and the screen, the operator's posture, the lighting and the background noise should be carefully tailored to prevent discomfort. Moreover, humidity, temperature and ventilation should also be controlled.

Actually, any prolonged mental or physical task can likely result in fatigue. Therefore, the type of task a VDT operator performs greatly influences the development of fatigue.

Lighting

Workstations and lighting should be arranged to avoid reflections on the screen or surrounding surfaces. Light should be directed so that it does not shine into the operator's eyes when the operator is looking at the screen. Further, lighting should be adequate to enable the operator to see the text and the screen, but not bright enough to cause glare.

In workplaces with windows, actual light in the work area may change considerably during the day and from season to season as the natural light changes. Artificial light can create "warm" or "cool" environments that influence the ease of reading. Red, orange and yellow colors are considered "warm" and greens and blues are considered "cool." Generally warm lighting is pleasant at low levels while cool lighting is more appropriate for brighter lighting.

Normal office lighting can be supplemented by individual "task lighting" at a workstation if necessary. Task lighting is particularly helpful for VDT work, especially since it enables operators to adjust lighting to their individual preferences.

Glare

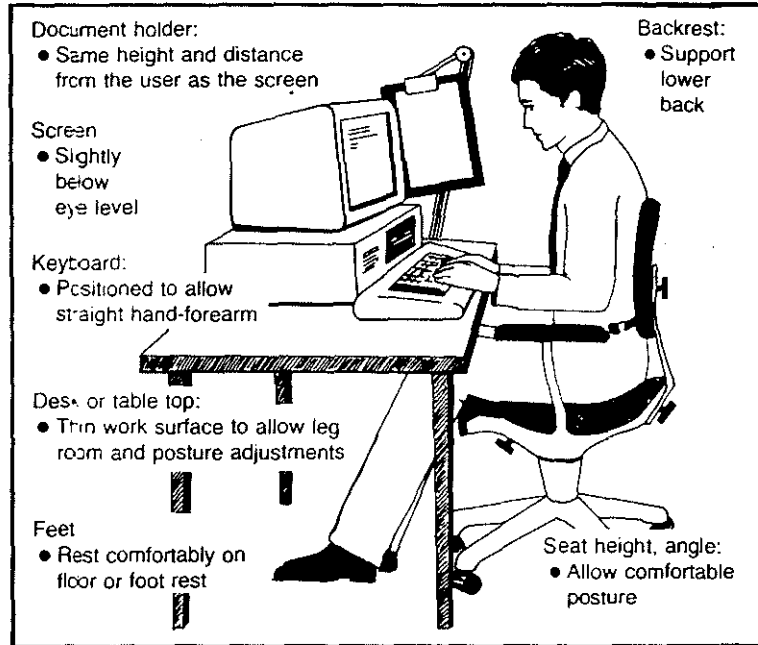
Glare is defined as a harsh, uncomfortably bright light. At a VDT, glare is the result of the reflection of light on a VDT screen or other reflective surface such as a shiny keyboard. Anti-reflective screen treatment can be added to a VDT screen to lessen its contribution to glare. Later model processor keyboards tend to have an anti-glare matte finish.

To avoid glare, display screens may be placed near a window so the line of sight between eye and screen is parallel to the window surface. If this is not possible, the windows can be shielded to reduce excess sunlight and to minimize glare.

To limit reflections from walls, the walls should be a medium to dark color and painted with a nonreflective finish. In addition, work surfaces visible around the screen should have nonreflective finishes.

Workstation Design

An individual workstation should provide the operator with a comfortable sitting position sufficiently flexible to reach, use and observe the screen, keyboard and document. Some general guidelines to minimize fatigue include:



Posture support

The seat and backrest of the chair should support a comfortable posture permitting occasional variations in the sitting position. Chair height and backrest angle should be easily adjustable. A foot rest may be necessary for short individuals.

Arms

When the operator's hands are resting on the keyboard, the upper arm and forearm should form a right angle. The hands should be in a reasonably straight line with the forearm. Long or unusually high reaches should be avoided. Armrests would permit periodic support as needed.

Legs and feet

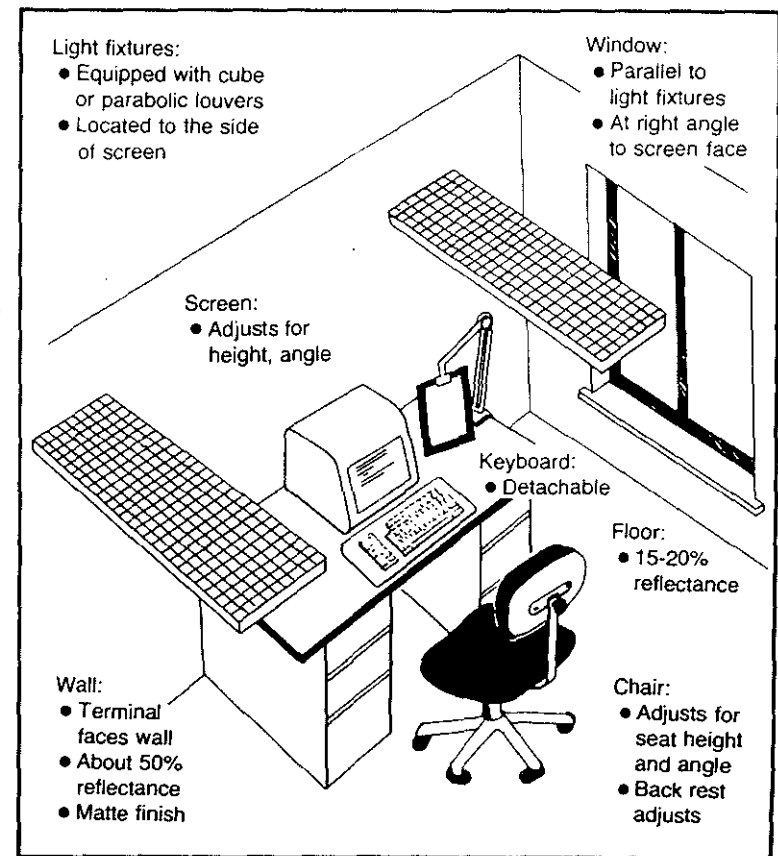
The chair height is correct when the entire sole of the foot can rest on the floor or footrest and the back of the knee is slightly higher than the seat of the chair. This allows the blood to circulate freely in the legs and feet.

Adjustment of screen position

Screens which swivel horizontally and tilt or elevate vertically enable the operator to select the optimum viewing angle.

Workstation surface

The table or workstation should suit the kind of task to be done. It should be large enough for any reference books, files, telephone, text and so forth and also permit different positions of the screen and keyboard. Adjustable surface height is an advantage.



Eye and screen

The topmost line of the display should not be higher than the user's eyes. The screen and document holder should be the same distance from the eye (to avoid constant changes of focus) and close together so the operator can look from one to the other without excessive movement of the neck or back. The incline of the document holder should be adjustable. Legibility is a prime consideration in selecting a display screen. This also applies to document selection. Legibility factors to be considered include: symbol size and design, contrast and sharpness.

Adjustment of the keyboard

A movable keyboard is a plus. It can be arranged to suit the type of work and the need to consult documents or notes. Options for keyboard placement should be taken into account in choosing the size of the table surface.

Task Considerations

The type of task performed on a VDT influences the development of fatigue. Therefore, in designing a workstation, probable tasks are an important factor. Some typical tasks include:

Text entry

Entering text or data involves intensive use of both hands. For this task, the keyboard should be directly in front of the operator and the screen and copyholder should be side by side.

Alternate tasks

An L-shaped work surface is well-suited to an operator who performs a number of tasks such as writing or attending to a printer in addition to using a keyboard and screen. This arrangement allows the operator to swivel the chair between tasks.

Retrieving information

Information retrieval generally requires using one hand on the keyboard while thumbing through documents with the other. Operators involved in information retrieval often prefer the keyboard slightly to one side and the screen to the other, with their forearms resting on the table surface.

Whatever the task, it is desirable that there be some "job control" available to the individual VDT operator—the ability of the worker to pace the work, add mini-breaks or change desk positions. This can be a good mitigating factor in the tempering of physical discomfort—and in any subsequent lessening of fatigue.

References

*Ergonomics—for Human Effectiveness and Well-Being**, AES Data Inc., Edifice AES, 100, boul. Alexis-Nihon, Bureau 600, Montreal, Canada H4M 2P2, 1983.

OSHA General Industry Safety and Health Standards, 29 CFR 1910 (29 CFR 1910.97 Nonionizing radiation, 29 CFR 1910.95 Occupational noise exposure, and 29 CFR 1910.300-399 Electrical standards). Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

American National Standard Practice ANSI/IES RP-1-1982, *Office Lighting*. Illuminating Engineering Society of North America, New York, NY 10017.

Potential Health Hazards of Video Display Terminals, NIOSH Research Report. DHHS (NIOSH) Publication No. 81-129, 1981. Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

An Evaluation of Radiation Emission from Video Display Terminals, U.S. National Center for Devices and Radiological Health, DHHS (FDA) Publication No. 81-8153, 1981. Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

Workplace Guidelines for VDTs, Washington State Department of Labor and Industries, Division of Industrial Hygiene, P.O. Box 207, Olympia, WA 98504, 1985.

"An Investigation of Health Complaints and Job Stress in Video Display Operations," Smith, Michael J., et al., *Human Factors*, 1981, 23(4), 387-400. The Human Factors Society, Inc., Box 1369, Santa Monica, CA 90406.

*OSHA acknowledges the use of some of the concepts presented in this reference.

"Evaluation of Work Station Design Factors in VDT Operations," Stammerjohn, Lambert W., et al., *Human Factors*, 1981, 23(4), 401-412.

Ergonomic Design for People at Work, Vol. 1—Workplace, Equipment and Environmental Design and Information Transfer. Rogers, Suzanne H., ed., 1983. Lifetime Learning Publications, Belmont, CA 94002.

Other reference periodicals include:

Ergonomics, Ergonomics Society and International Ergonomics Association, Taylor and Francis, Philadelphia, PA 19106. (monthly)

Applied Ergonomics, Butterworth & Co., Surrey, England GU25BH. (quarterly)

American Industrial Hygiene Association Journal, American Industrial Hygiene Association, Akron, OH 44311. (monthly)



WOHRC NEWS

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SPECIAL ISSUE:

VDT'S AND HEALTH

This special issue of WOHRC News explores worker health and VDTs, also providing background on international regulatory and union activities. And, since appropriate installation of a VDT is essential for optimum worker health, WOHRC has assembled some handy guidelines and tips for setting up an effective VDT workstation.

It has been predicted that about half of all American workers will be using a VDT on the job. Similar trends are occurring throughout the industrialized world. The extent of use will vary, but VDTs, the usual connection between a human being and a computer, are a widespread versatile work tool.

Are VDTs dangerous? Do they pose a threat to health and well-being of users? Some people say 'yes,' citing clusters of birth defects, eye strain, worker stress and other problems. Others say such fears are unfounded; that they are a natural response to new technology and perhaps to fears of job loss or boredom from automation of work.

Although much more research is needed, current evidence shows that VDT work can be stressful and strain the eyes and musculo-skeletal system. The feared risks to normal childbearing have not been established, although definitive studies which will completely resolve the issue have not yet been carried out. The health data are summarized on the following page.

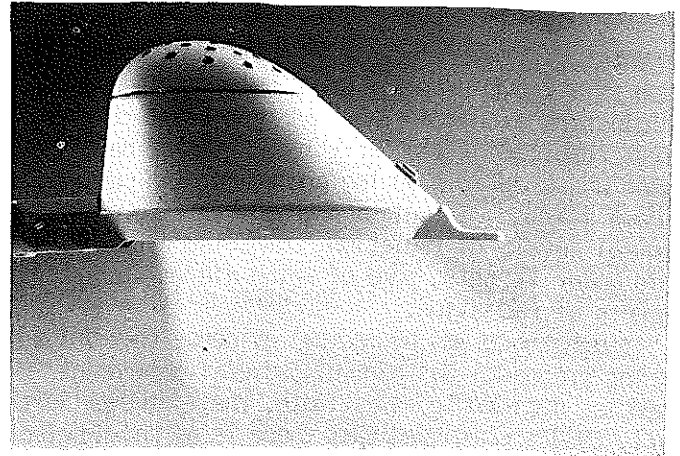
~ ● Briefly Noted ● ~

Int'l VDU conference draws thousands

The 1st International VDU Conference, held in Stockholm in May 1986 and sponsored by the Swedish National Board of Occupational Safety and Health, drew thousands of researchers, government representatives, trade unionists and science and policy writers from around the world. Research findings on visual, musculo-skeletal, reproductive and other health effects were presented. A wide array of papers on the organizational and social aspects of work were also included. Selected papers from the Conference will be published by Elsevier. (See p. 7 for further info.)

NIOSH off again/on again: on again

In 1982 the U.S. National Institute for Occupational Safety and Health, NIOSH, proposed a VDT



Shedding light on the issue

- **Winners of int'l ergonomics contest (including LEDU lamp shown above)**
- **Designing a VDT Workstation**
- **Int'l survey of VDT laws & union contracts**

study, primarily aimed at the question of potential reproductive effects. Beseated by problems from the outset, the study finally zeroed in on a population of VDT-using phone company operators at Bell South, with AT&T long distance operators who perform similar tasks without VDTs as a comparison group. It was to include questions on stress, as well as general reproductive health.

But phone company Harvard and Brown University based consultants Brian MacMahon and Sally Zierler criticized the study as being invasive, with questions on fertility, and too broad, with questions on stress. The White House Office of Management and Budget, using its authority under the Paperwork Reduction Act, disapproved the protocol using the consultant critique as one basis. A prime criticism was 'recall bias,' where it was felt that VDT users with adverse reproductive outcomes would selectively remember these events while non-users might not report miscarriages.

So it's back to the drawing boards for NIOSH. OMB has approved the study if the consultant critique is incorporated. That means no questions on fertility or stress and adjustments to be made for recall bias. The study may begin this fall.

(cont'd)

Technical Specifications agreements contain highly specifying the construction and use of this technical detail is the one shown on page 4, which is taken between the State Bank of Victoria Union. Such detail is not typical agreements in other areas of work. rest pauses at specified intervals of VDT use are found in most there is an emphasis on full-body group exercise during rest Canadian contracts, such as that Communications Workers and Bell Canada, governing the right to transfer agreements have been concluded. A disclaimer by pregnancy stating that no known reproductive hazard established for VDT work, is typically

9-to-5 Insurance Industry Landmark agreement between District 925 of the Service Employees International Union and the Equitable Life Insurance Society established some major precedents in the largely non-union insurance industry. It was led after a long and often bitter strike, largely based on the implications of automation and includes several provisions similar to those given in table on page 7.

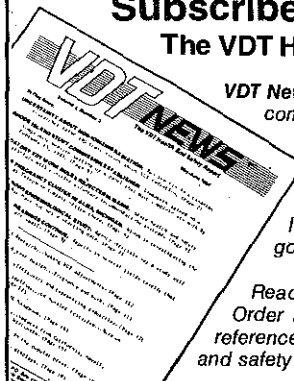


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