

VIDEO DISPLAY TERMINAL (VDT) USE GUIDELINES

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A number of questions have been raised regarding the impact of VDTs on employee health and the work environment. The purpose of this information sheet is to provide responses to many of these questions. It should be noted that these guidelines have been developed for personnel who use VDTs for extended periods of time each day. These recommendations do not apply to every situation in which VDT is used.

RADIATION

Many VDT operators have questions about their potential exposure to radiation. The Bureau of Radiological Health regulates the manufacturer of VDTs and conducts extensive studies to insure that terminals do not emit harmful levels of radiation. Further, the National Institute for Occupational Safety and Health (NIOSH) has measured radiation being emitted from machines now in use and has concluded:

"The radiation levels emitted by a VDT are very low compared to current occupational exposure standards. In many cases, the levels are below the detection capability of the survey instrumentation used. Based on the survey data, NIOSH concludes that VDTs do not emit radiation levels that present a hazard to employees working at or near the terminals."

Between 1982 and 1985 a pilot study was conducted at the East-West Center to determine radiation levels from VDTs. During the study, 165 new terminals and all terminals returned from repair were surveyed for x-ray and ultraviolet radiation. During the three-year study no measurable radiation emissions were found at any of the terminals. Extensive studies by a variety of other private and government agencies, including the National Academy of Sciences, have consistently demonstrated the absence of any radiation hazard associated with VDT use.

Since the pilot study, annual surveys have been conducted at East-West Center to determine radiation levels from VDTs. Ultraviolet (UV) and x-ray surveys performed yearly on over 300 VDTs showed levels of between 50 to 1000 times below the National Institute of Occupational Safety and Health (NIOSH) standards for UV and 50 times below for x-ray.

VISION

VDT operators may experience visual fatigue or "tired eyes" from

VDT use. While there is no evidence of long term adverse visual effects resulting from VDT use, periodic eye examination are recommended for heavy users of VDTs. Factors contributing to visual fatigue include:

General

Displays should be selected with viewing in mind. For example, color and image size may be selected for individual preference. In addition, the "refresh" rate (ability of the machine to project and maintain the image on the screen) should be high.

Contrast

Contrast is the difference between screen and working environment illumination. While it has not been demonstrated that reduced contrast is responsible for inducing visual fatigue, it does increase reading time, thus slowing production.

Accommodation

The entire display should be sharp focus. A lack of sharpness of the characters on the display terminal continually forces the eyes to attempt to focus the image. If the image itself is blurred, the attempt to focus the image is futile. This continual accommodation may be a source of eye fatigue.

Glare

If glare (or a reflected image) is present on the display terminal, the eyes will attempt to focus on both the VDT image and the reflected image resulting in continued accommodation and potential visual fatigue. Glare may be eliminated by placement of an appropriate filter over the terminal screen, placing the screen at a ninety degree angle to windows or other light sources, covering the windows, and/or the use of task lighting.

Copy Location

The copy holder should be placed between the keyboard and the screen or adjacent to the screen. The copy holder distance and tilt should be adjustable. This will minimize refocusing between the two surfaces.

MUSCULOSKELETAL

VDT operators often complain of various types of musculoskeletal discomfort. Most of the complaints relate to neck, shoulders, back, arms and hands. Uninterrupted VDT use may lead to specific muscle or muscle group fatigue. Musculoskeletal discomfort may be attributed to the following: the design of the work station, repetitiveness of the task, degree of postural constraints, work pace, work/rest schedules, and personal attributes of individual workers. Each of these factors should be included in a review of

the VDT working environment.

WORKSTATION DESIGN

The VDT station should be arranged to fit the physical characteristic of the individual worker. Where applicable, workers should be trained to adjust furniture, screen and keyboard. Listed below are some specific recommendations (see diagram for additional information):

The Monitor

- . The top of the screen should be no higher than eye level.
- . The monitor should stand at a 90-degree angle to any windows to reduce glare.
- . The monitor should be in front of a neutral or non-shiny background.
- . The screen should be 18-30 inches from the user's eyes, or at about arm's length.

The Keyboard

- . At the keyboard, the user's upper arms should be perpendicular to the floor and the lower arms should be parallel to the floor.
- . A pad or other support should be placed under the wrist, especially if the keyboard feels too high. If necessary, the keyboard can be raised by placing boards under it.
- . The home row of a detachable keyboard should be centered in front of the monitor.

Seat Position

- . One's chair should be adjustable so that the soles of the user's feet are flat on the floor, with 3-6 inches of legroom between the user's lap and desk or keyboard; and the knees bent at a 90-degree angle while sitting up straight.
- . If the chair cannot be adjusted, the user can place a board or box under his feet.
- . The chair should have good back support. The backrest should be adjustable so the lower back is fully supported.

The Desk

- . The user should have free movement of the legs beneath the desk.
- . The desk should be large enough to accommodate the keyboard and monitor without placing the monitor off to one side.

Work/Rest Schedule

- . The user should avoid continuous keyboarding. A user who breaks up a four-hour typing job into four periods staggered

throughout the workday is much less likely to suffer from fatigue than one who types for four hours straight. Every few minutes the user should look at something besides the monitor to refocus the eyes and get up and walk around whenever convenient.

- Among the guidelines suggested for reducing potential employee stress from continual VDT operating is the use of task rotation and/or rest breaks. Simply getting up and exercising the large muscles of the body by walking and stretching will relieve many of the physical discomforts associated with prolonged VDT use. Performing other job-related tasks that are less demanding on the eyes and body muscles will also help to lessen some of these effects. NIOSH has recommended that:

A fifteen (15) minute work/rest should be taken after two hours of continuous VDT work for operators under moderate visual demands and/or moderate workload.

A fifteen (15) minute work/rest break should be taken after one hour of continuous VDT work for operators under high visual demands of high workload and/or those engaged in repetitive work tasks.