

**GUIDELINES ON
OCCUPATIONAL SAFETY AND HEALTH
FOR WORKING WITH
VIDEO DISPLAY UNITS (VDU's)**

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PREFACE

Technological developments in the field of microelectronics and information technology have given rise to a rapid growth in office automation in every branch of industrial activities. Video display units (VDUs) or video display terminals, herein after referred to as "VDUs", have been widely introduced into the workplace. Along with the increase use of VDUs there have been reports and expressed concern about the health effects largely related to musculoskeletal disorders, visual discomfort and other stress related disorders.

Report of occurrence of musculoskeletal disorders are frequent among VDU operators. The common complaints are fatigue and body aches.

Visual discomfort is also a common complaint associated with working with VDUs. The symptoms are normally transitory and there is no indications show that working with VDUs would cause permanent impairment to the eyes. Such discomfort may be caused by other types of work or of the job activities.

Million of workers throughout the world are using VDUs at work. In the wake of this common use of VDUs and the expressed concern about potential adverse health effects among VDUs operators, the Department of Occupational Safety and Health publishes this booklet as a guide for employers and employees who work with VDUs. This booklet provides explanation of questions that are most commonly asked about VDUs and its also suggests simple adjustment that can be made to the workplace to make it more comfortable and minimized any ill effects. Employers and employees will have to determine the practicality of these measures with their own specific context.

The guidance is not mandatory and employers and self-employed persons are free to choose other ways and means of complying with the provision of the Occupational Safety and Health Act, 1994. Nevertheless, adoption of these guidelines will likely go a long way towards compliance with this Act.

These guidelines will be reviewed from time to time. Concern parties are welcome to response with feedback to the Department in writing with a view to making the guidelines more comprehensive and user friendly.

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PURPOSE OF THE GUIDELINES

The purpose of these guidelines is to provide employees with information related to the design, set-up, application, usage and overall management of VDU related work. If properly used these guidelines will help to boost VDU work related health and safety standard in the workplace and at the same time may help to improve employees' productivity.

This guideline are also intended to help in minimizing adverse health effects to the VDU users arising from VDU related work.

This guideline is divided into six main parts Part I gives definition and explanation on various terminologies commonly used when discussing about health and safety aspects of VDU work. Brief explanation on legal requirements pertaining to VDU work is given in the part II. Explanation of possible health effects associated with VDU work is given in the part III. Part IV gives information and explanation about various possible preventive measures that can be used to minimize health and safety related problem resulting from VDU work. Part V and VI give useful and practical tips to VDU user on what they can do in order to help themselves.

These guidelines are applicable to work situation where use of VDU contributes to a significant part of the work performed.

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1.0 DEFINITIONS

Brightness – means the attribute of visual sensation according to which a surface appears to emit or reflect more or less light.

Illumination – means the measure of the stream of light falling on a surface. The light may come from sun, lamps in a room or any other bright surface. The unit of measurement is the lux (lx). Imperial unit for illumination is foot-candle.

Luminance – means the measure of the brightness of a surface; the perception of brightness of a surface is proportional to its luminance. Therefore, luminance is a measure of light coming from a surface. Since it is a function of the light that is emitted or reflected from a wall, furniture and other objects, it is greatly affected by the reflected power of the surface. The luminance of a lamp on the other hand is an exact measure of the light they emit.

Musculoskeletal disorder – means a broad range of conditions of varying degree associated with the upper extremities (hand and arm) such as inflammation or trauma mostly of the tendon, muscle-tendon junction or surrounding tissue; inflammation of tissue of the hand; compression of the peripheral nerves serving the upper limb; and include temporary fatigue, stiffness of the muscles comparable to that of unaccustomed exertion.

Negative polarity – means light characters on a dark background

VDU user – means any worker who uses a VDU as significant part of his normal work.

Positive polarity – means dark characters on a light background

Reflectance – means the comparison of the luminance of various surfaces are compared they also can be expressed as reflectance, which is the ratio between incident and reflected light. Reflectance is usually expressed as the percentage of reflected to incident light.

Video Display Unit / Terminal – means any alphanumeric or graphic display screen, regardless of the display process employed.

Workstation means an assembly comprising VDU, which may be provided with a keyboard or input device and/or software determining the worker/machine interface, optional accessories, peripherals including the diskette drive, telephone, modem, printer, document holder, work chair and work desk or work surface, and the immediate work environment surrounding the VDU.

Work Surface means the part of workstation upon which equipment is placed and tasks are performed

2.0 POSSIBLE HEALTH EFFECTS



- 2.1 The most common symptoms associated with VDUs work or operations are visual problems and musculoskeletal injuries. Visual factors include eyestrain and headaches, which affect visual performance. Users with existing visual deficits may find them more noticeable.
- 2.2. These symptoms may be caused by:
- Staying in the same position and concentrating on screen of VDU for a long time;
 - Poor position of VDUs;
 - Poor legibility of the screen or sources documents;
 - Poor lighting, including glare and reflection; and
 - A drifting, flickering or jittering image on the screen.
- 2.3 A range of conditions of the arm, hand and shoulder discomfort are linked to work activities associated with VDUs. Users may also experience varying level of discomfort in the hand, wrist, forearm, neck and lower back. An acute strain can present as muscle fatigue, aches, pain, weakness, tenderness and /or swelling which subside with rest. The more chronic conditions present with more significant symptoms as well as impaired function, affecting activities of daily living, such disorders among keyboard workers have often be associated with high workloads combined with tight deadlines. Factors, which may contribute to the disorder, include but not limited to:
- Fixed or sustained postures at the workstation;
 - Repetitive movements; and
 - Increase muscle tension leading to excessive muscle fatigue.
- 2.4 Another less common health issue in relation to VDU operations is radiation emission and their effects. Anxiety about radiation emission from VDU and possible effects on pregnant women has been widespread. Studies to date from a number of countries have shown that electromagnetic radiation emission is well below existing safety standard limit of exposure. In the light of scientific evidence pregnant women do not need to stop working with VDUs. However, to avoid problems caused by stress and anxiety, women who are pregnant or planning to have children and are worried about working with VDUs should be given the opportunity to discuss their concerns with someone adequately inform with current authoritative scientific information and advice.

- 2.5 Studies have also suggested that job stress is a risk factor contributing to VDU user health complaints. Early presentation of symptoms may include malaise, nervousness, irritability and indigestion. More often than not, these symptoms are not recognised, and are attributed to other cause.
- 2.6 Some VDU users have reported facial skin complaints such as occasional itching or reddened skin on the face and/or neck. These complaints are relatively rare and the limited evidence available suggests they may be associated with environmental factors, such as low relative humidity or static electricity near the VDU.

3.0 REGULATORY REQUIREMENTS

The Occupational Safety and Health Act 1994 aims to secure the safety, health and welfare of person at work, to protect other others against risks to safety or health in connection with the activities of person at work, and to promote an occupational environment for persons at work which is adapted to their physiological and psychological needs.

Among the salient provision of the act are:

3.1. General Duties of Employer

Employer must safeguard so far as practicable, the health, safety and welfare of people who work for them. This applies in particular to the provision and maintenance of a safe plant and system of work. Arrangements must also be made to ensure safety and health in the use, handling, storage and transport of plant and substances. In the context of this act 'plant' include any machinery equipment, appliance, tool and components including video display units.

The act also required the employer to provide necessary information, instruction, training and supervision of employees to enable them perform their job safely. Aspect of maintaining workplace working environment and to ensure availability of adequate welfare facilities are another general duties of employer specified under the act.

3.2 Duty to Formulate Safety and Health Policy

An employer must prepare a written statement of his general policy, organisation and arrangements for safety and health at work, keep it up to date by revision, and bring it to the notice of his employees

3.3 Formation of Safety and Health Committee

An employer of 40 or more persons, or when directed by the Director General, must establish a safety and health committee at the workplace. The committee's main function is to keep under review the measures taken to ensure the health and safety of persons at the workplace and investigate any related matter arising such as complaints and incidents. There shall always be consultation and cooperation between the employer and committee on safety and health matters.

3.4 Duties of Employees

Employees have a duty under the act to take reasonable care to avoid injury to themselves or to others resulting from their work activities. They also have to cooperate with employers and others in meeting regulatory requirements pertaining to occupational safety and health. The employees as well require not to interfere with or misuse anything provided to protect their safety, health and welfare in compliance with the act.

An employee is protected from being discriminated or injured or his position altered to his disadvantage, if he or she make a complaint on a matter which he or she consider not safe or exercise his or her function as a safety and health committee member.

3.5 Notification of Accidents and Occupational Diseases

An employer must notify the nearest occupational safety and health office of any accident, dangerous occurrence, occupational poisoning or disease which occur or likely to occur at the workplace.

Every registered medical practitioner or medical officer attending to, or called in visit, a patient whom he believes to be suffering from occupational poisoning occupational diseases listed in the Factory and Machinery Act or named in Occupational Safety and Health Act (Declaration of Occupational Diseases) Order, 2000 must also report to the director general.

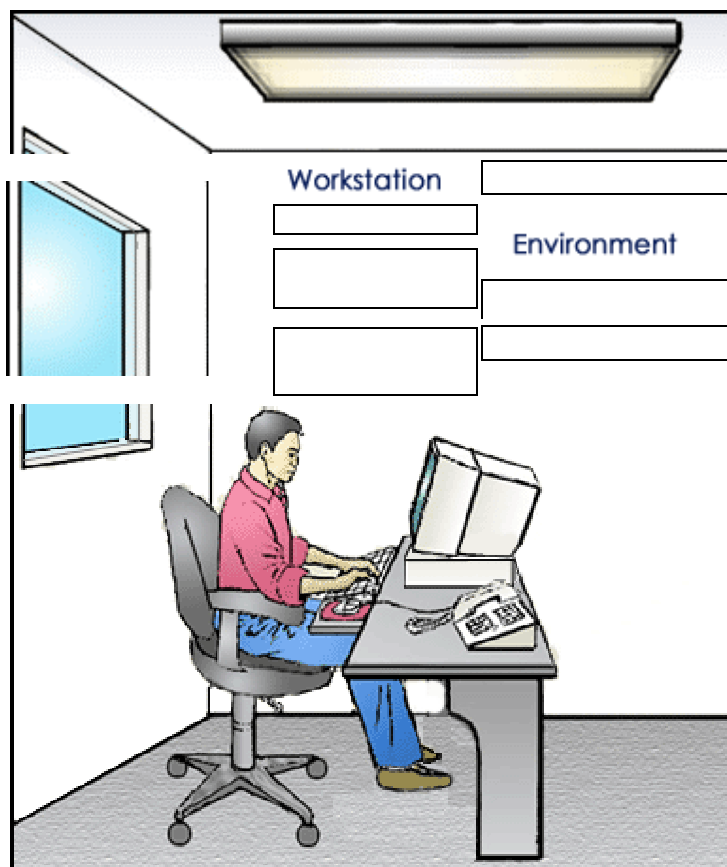
4.0 STRATEGIES FOR PREVENTION

The variety of factors contributing to VDU work risk, these require a risk reduction strategy, which embrace the total situation, includes:

- Workplace design
- Equipment and system factors
- Work environment factors
- The nature and organisation of work
- Maintenance of VDU equipment and furniture
- Staff selection and pre-employment medical examinations
- Provisions of training and information

4.1 Workplace Design

VDU workstations should be ergonomically designed with maximum possible flexibility so that they can be adapted to each individual operator.



4.1.2 Basis for Selection of Workstation Furniture

Selection of the appropriate furniture should be made on the following basis

- a. Tasks performed at the workstation e.g
 - i. Data processing
 - ii. Word processing
 - iii. Typing
 - iv. Typesetting
 - v. Counter operation, e.g banking; and
 - vi. Programming
- b. Duration and intensity of the tasks.
- c. Equipment to be located at the workstation
- d. Environment in which workstation is located
- e. Method of operation of equipment
- f. Changing nature of function of workstation
- g. Whether the workstation is single or multiple user

4.1.3 Work Desk or Work Surface

Size. The desk or work surface shall be large enough to allow a flexible arrangement of the screen, keyboard, documents and related equipment. There shall be adequate space for workers to find a comfortable position.

Safety. Work desk or work surface, particularly the underside of the work surface, should not have any sharp edges, corners, protrusion, or rough surfaces likely to cause injury to users or damage to their clothing. Moving parts within the work desk or work surface should not create hazards.

Cable Management. Facilities should be incorporated within the work desk or work surface design to accommodate the cables required for power, data transmission, and telephone demands of the workstation, and to stow any excess cable. Switches are used regularly should be readily accessible. Provision should be incorporated for cable maintenance.

Storage Facilities. Storage facilities for frequently used items should be provided at each workstation. Storage facilities should:

- a. Be stable and not present a hazards when fully loaded;
- b. Be constructed so that they can be opened, closed, and locked from the normal operating position; and
- c. Have at least one lockable section in which the operator can store personal belongings.

Where located under an adjustable work surface, storage facilities should be mobile, and should be not more than 550 mm in height so that full work surface adjustment is not obstructed.

Work Desk or Work Surface Height Adjustment. Where feasible height should be adjustable to the preference of each operator. The following figures are given as yardsticks for recommended height of desk or surfaces:

- If fixed height is acceptable, then the height of the work surface should not less than 650 mm and greater than 750 mm;
- For those with adjustable height, the required range of adjustment is at least 600 –750 mm.

Work Surface Finish. The work surface should be a neutral colour such as light brown and have satin or matt finish. The work surface should also be easy to clean and finished so that it is possible to write on a single sheet of paper with no backing.

Construction. The workstation shall be rigid and stable. Sufficient space should be provided under the work surface to allow free leg movement without obstruction. Cables and other equipment should not encroach into leg space.

Modesty Panel. Workstation should have a modesty panel to provide operator privacy under the work surface. The modesty panel should not interfere with work surface height adjustment.

4.1.4 Chairs



The chairs shall possess the following features

- a. Stable and allow the operator easy freedom of movement and a comfortable position;
- b. Adjustable height (gas lift for multi-user workstation, screw adjustment suitable for single-user only) in the range between 350 mm and 450 mm;
- c. Backrest that are adjustable in both height and tilt to provide adequate back support especially at the lower back region (lumbar);
- d. Reasonable firm seat cover and “waterfall” front;
- e. Arm rest if provided, should not interfere with the keyboard operation; and
- f. Wheels or castors (5-star base) for stability and mobility.

A footrest should be made available to any one who wishes for one. Where the seat pan is fixed, it should be horizontal. Where there is tilt, recommended tilt is between a maximum of 10 degrees forward and 5 degrees backward. The seat should swivel about vertical axis central to the flat part of the seat.

4.1.5 VDU's Equipment and Furniture Adjustment

The height of the seat and the position of the keyboard, the display terminal, work surface height and others should be adjusted as a whole, so as to avoid an uncomfortable posture in continuous operation. For this purpose the following should be kept in mind:-

- a. It should be possible for the operator to sit on the chair with his back adequately supported by its backrest, and to allow the entire soles of his shoes to touch the floor. A non-slippery footrest of sufficient size should be provided, if necessary.
- b. The height of the seat should be adjusted so as to avoid too much pressure under the operator's thigh. It is advisable to keep an allowance for fingers to be inserted smoothly between the underside of his thigh and the seat.
- c. It should be possible for the fingers to reach the keyboard naturally with the upper arms dropped almost perpendicular and at an angle of 90 degrees or an appropriate larger angle maintained between the upper arms and the forearms.
- d. The upper edge of the display screen should be at a height lower than the operator's eye level. A viewing distance of not less than 400 mm should be maintained.
- e. The display screen and keyboard or document should be located so as to avoid extreme difference in distance from the operator's eye; they should be placed within an appropriate range of vision.

Typical arrangement of a VDU workstation is shown in the appendix 1.

4.1.6 Document Holders

The need for a document holder and the appropriate design and use of such equipment depends on the task. Document holders are important to reduce visual and neck muscle fatigue. Figure 1 gives examples of ideal position for document holder for performing three different tasks.

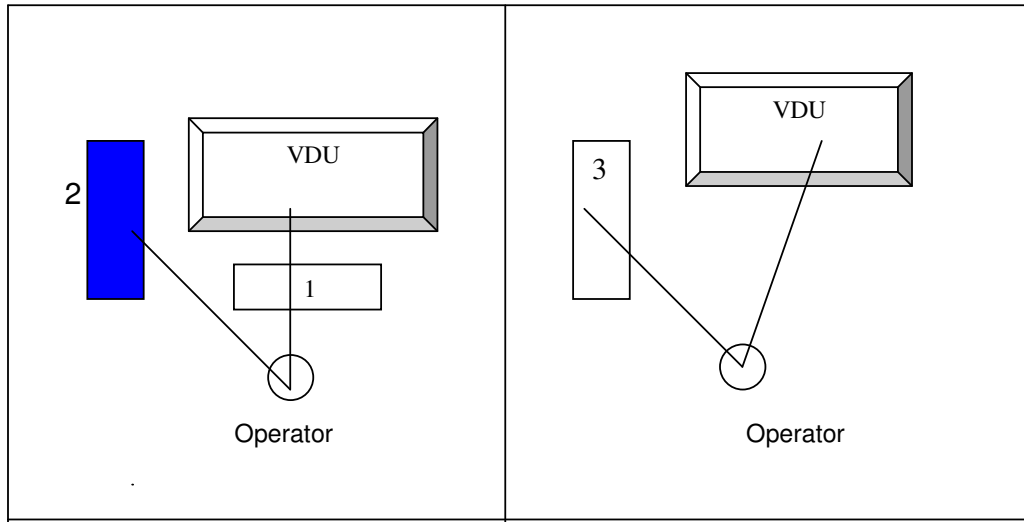


Figure 1 : Recommended position of document holder for various tasks

1. Document holder directly below the screen – visual flexion to the screen and document without neck movement; ideal for continual page turning.
2. Document holder to the immediate left or right of a central screen – used when the screen is viewed most of the time. When the document is most viewed, the document should be central with the screen on either side.
3. Document holder and screen central to the operator – ideal positioning for when both document and screen are equally viewed.

4.2 Equipment and System Factors

When preparing specification for the acquisition of computing equipment, consideration must be given to the following aspect:-

4.2.1 Display Screen

a Construction

Display screen shall conform to local or internationally recognised standards.

b Screen image control

Screen image control should be clearly labelled, accessible, easy to use and located so as to prevent accidental operation. The VDU shall have a control for adjusting the brightness of the image and background together. The control should be positioned so that an operator can view the screen while adjusting the brightness and contrast.

c Glare

The screen shall be free of reflective glare and reflections liable to cause discomfort to the use. If provided anti glare filters should be easily attached to and from the VDU, and instruction for cleaning should be available. The image on the screen should be stable, with no perceptible flickering or others forms of instability.

d Adjustability

The screen must swivel and tilt easily and freely to suits the needs of the operator. The following adjustment are recommended:-

- Tilt about the horizontal:-5 to 15°
- Screen rotation, about the 50° to the vertical axis right and left from front

Provision for adjustment should be an integral part of VDU. VDU shall be easily adjustable by hand without the use of tools from the seated operating position. The VDU must also be stable at any position.

e Screen Luminance and Contrast

The background luminance of the screen shall be not less than 10cd/m². The contrast between characters and the background shall be adjustable.

4.2.2 Keyboards



a The keyboard shall be tilt able and separate from the screen so as to allow the operator to find a comfortable working position avoiding fatigue in the arms or hands.

b The keyboard should be stable. It should not slip, tip, or rock during normal keying activities. Key should have “QWERTY” arrangement. The shape of each key should have maximum touching surface area but possibility f slip is reduce during operation.

- c The case should have the following characteristics:
- Neutral matt finish
 - Reflection free
 - Resistance to dirt, dust and moisture
 - No sharp edges.
- d The space in front of the keyboard shall be sufficient to provide support for the hands and arms of the operator.

4.2.3 Mouse

- a For optimal control and avoidance of excessive static muscle use, a mouse should:
- Accommodate natural hand posture
 - Allow the wrist to rest on the work surface
 - Allow finger/s to rest on push-buttons without danger of accidental operation.

4.3 Work Environment



4.3.1 a. Illumination

Room lighting - shall ensure satisfactory lighting condition and an appropriate contrast between the screen and the background in environment, taking into account the type of work and the user's vision requirements.

Illumination level required will depend on the task performed. The following are recommended illumination levels at VDU workstations. It is recommended that the general background illumination level should be between 300 lux to 700 lux. Table 1 gives further recommendation of illumination level for performing three different tasks:

Table 1: Recommended illumination for VDU workstation for various tasks

Working conditions	Illumination levels (lux)
Task with Well printed source documents	300
Tasks with Reduced readability of source Documents	400-500
Data entry tasks	500-700

If the general lighting alone is not suitable for the use of the VDU's, then the introduction of local lighting should be considered.

b. Reflections and Glare

Two problems require special attention when lighting is considered. Firstly sharp luminance contrasts between a screen and its surrounding must be avoided. Secondly reflections and glare must be reduce or eliminate. A combination of approaches may be required. The best method of avoiding reflections is to position the VDU and/or the light sources appropriately.

A combination of the following approaches may be required to the reduce or eliminate reflected glare:-

- * Positions VDUs workstations at right angles to the windows. Light fixtures is preferable to be install to and on either side of the operator-screen axis refer to figure2 and figure 3.

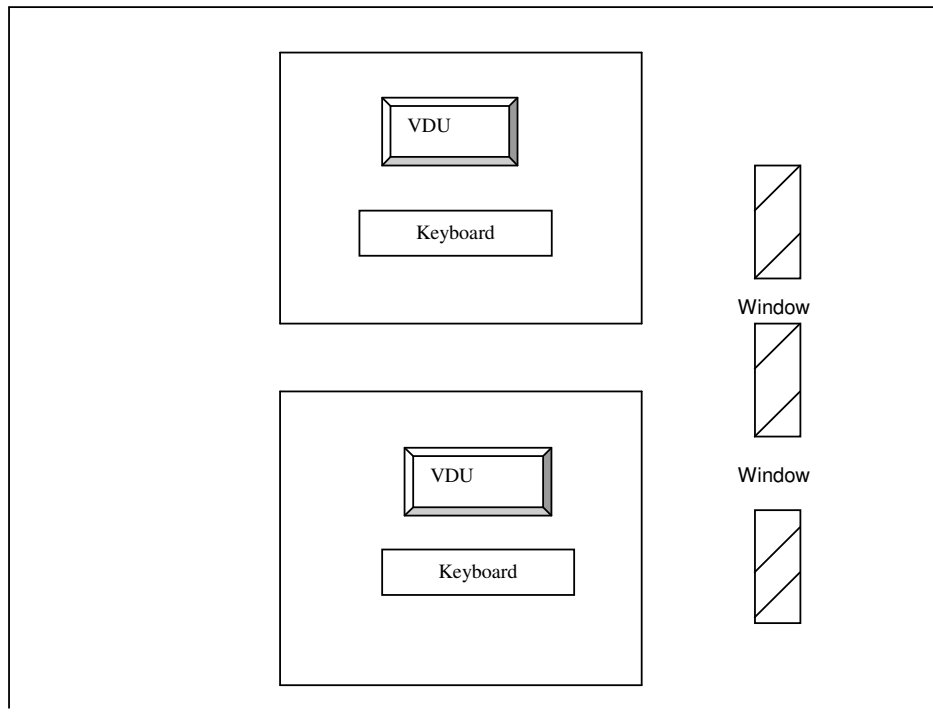


Figure 2 : Position of VDU's with respect to windows

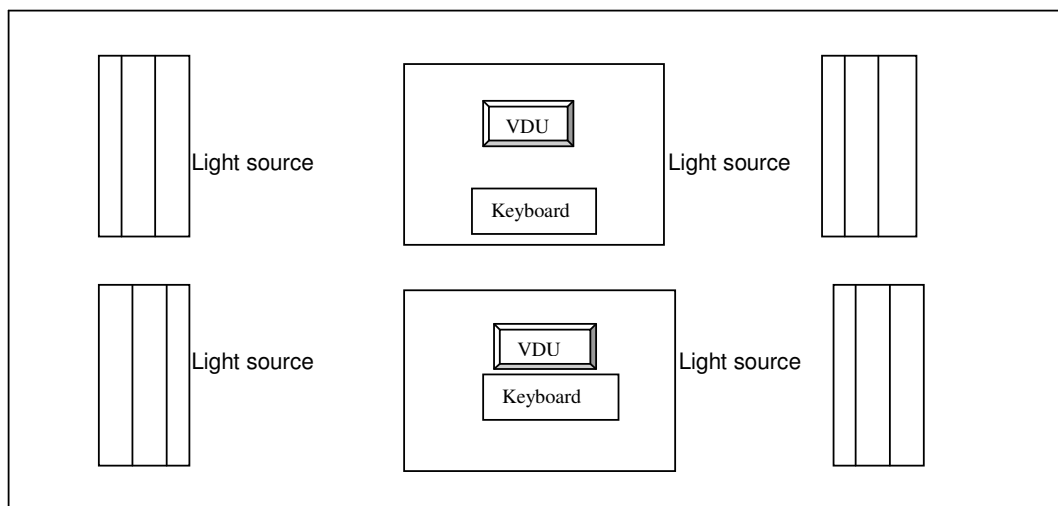


Figure 3: Position of VDU's with respect to overhead lighting

- * Cover all lighting with diffuser to direct light downward and away from the VDU screens. If it not possible to avoid glare or reflections use and indirect lighting e.g concealed or recessed light fixtures.
- * Fit all local lighting with a dimmer switch and suitably shield or screen the field of vision of other operators.

- * VDU screen should have anti- glare coating. If the VDU screen has no such coating, install an anti-reflection device on the screen to minimise reflected glare. Such device should not reduce the intensity and sharpness of the image.
- * Fit all windows with adjustable blinds, or curtain to prevent excess illuminance and reflected glare.
- * Where is not possible to avoid reflections by positioning the screen or adjusting lighting, install the screen hood to completely or partially shield the VDU screen from reflection.
- * Paints walls in the neutral tone colours. The surrounding equipments and furniture should be matt or darkened to avoid reflection from these sources. Avoid the use of shiny decorations and high reflectance surfaces in the work area.

4.3.2. Ambient Temperature and Humidity.

- a. VDU's and their associated equipment emit heat. This should be considered when positioning VDU's. Adequate ventilation and air conditioning system are normally required.
- b. Air currents from VDU blowers should be directed away from the operator since excessive air movement can cause drying of the eye surface and subsequent irritation.
- c. Consideration should be given at the purchase stage of VDU's and associated equipment with low thermal emissions. Information is usually available from equipment suppliers.
- d. The recommended ambient air temperature is between 23-27 degrees Celsius and the maximum relative humidity is 75%.

4.3.3. Ambient Noise Level

- a. The VDU work area should be comparatively quite, with minimal disturbing activities and noise.
- b. The affects of noise from printers, and other office equipment may be reduced by isolation, hooding or screening. The use of un-enclosed dot matrix printers adjacent to operators should be avoided.
- c. Noise from cooling fans, power supplies and keyboards should be minimal and this should be an important consideration at the purchase stage. Maintenance should be done immediately if equipment emitted excessive noise.
- d. The recommended ambient noise level for VDU work is between 40-60 dB(A).

4.4 Nature and Organisation of Work



4.4.1. Job Demands

a. Work Rates

Operators should work at a steady pace, consistently as opposed to maximal pace in short, sharp burst.

b. Work load

Increases in workload should be carefully managed with adjustment periods. Workloads should overall be realistic in relation to the individual's capacity.

c. Work Pauses and Rest Periods

Rest pauses are a physiological necessity if performance, efficiency and well-being are to be maintained. For most office jobs, including VDU work, it is recommended to divide the daily work into four periods, separated by one rest pause of 10-15 minutes in the morning and one in the afternoon shift and by lunch break of about 45 minutes at mid day. All breaks should be taken away from the VDU workstation.

A sustained sitting posture should not be maintained for more than 20 minutes and it is recommended that keyboard operators change task after a maximum of 50 minutes for a period of at least 10 minutes (alternative work).

4.4.2. Job Variety and Rotation

- a. The purpose of rotation through task and job variety is to allow rest of specific muscle groups and to eliminate prolonged periods in sustained postures.

- b. It is recommended that VDU work is interspersed with other office duties. If is not possible, operators should take “productive rest breaks” away from the VDU.
- c. Productive rest tasks allow for a change in posture and the resting of muscles. These include task such as proof reading, checking answering telephones, discussion. These should intersperse throughout the work routine.
It is recommended that VDU operators have several varied tasks on going and that they rotate through them, completing the tasks in a “piece meal” fashion. e.g., several periods of photocopying to break keyboard work rather than completing all at once.
- e. The variety tasks can be group as follows:-
 - Fine hand e.g keying, writing, small tools use;
 - Gross arm e.g. photocopying, filing, sorting;
 - Productive rest e.g. proofreading, checking.

4.5 Maintenance of VDU Equipment and Furniture

To maintain a good working environment at all times and to ensure suitable adjustments of VDU equipment to actual operation, the following measures are recommended:-

- a. Daily Checking and Adjustment

As part of routine work, prior to the day’s operation or at an appropriate time (e.g., when an operator took over any VDU tasks from his colleague), in the course of the work, the VDU operator should check lighting, anti glare measures, ventilation, etc., and adjust the VDU display or screen, keyboard, chair and table.

- b. Cleaning

The work place, VDU’s and other equipment should always be kept clean. Screens should be regularly cleaned using proper cleaning agents and cloths.

4.6 Staff Selection and Pre-Employment Medical Examination

Employers may provide medical examinations to new workers appointed to position involving significant VDU’s operations. Such examinations should include screening for physical characteristics and visual abnormalities.

In order to obtain good knowledge of health condition of worker newly assigned or reassigned to VDU work, and to prepare for the future care of worker’s health, the following examination are recommended:-

- a. Work history
- b. Medical history and subjective symptoms

- c. Ophthalmologic test i.e.,
 - * Vision test;
 - * Test of eye position
 - * Test of amplitude of accommodation;
 - * Measurement of ocular tension.
- d. Objective musculoskeletal examinations
 - * Inspection and palpation
 - * Test of gripping strength

Any factors detrimental to a worker's health which have been detected through pre-employment or periodical health examination should be analysed in detail and appropriate health guidance or other services should be provided to the worker concerned in accordance with the physician advise.

4.7 Provision of Training and Information

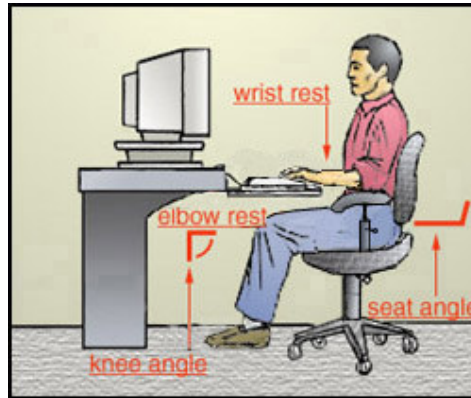
Training needs and information will vary according to the type of equipment, work demands and operator in respect of the topics listed below:-

- * Effects of VDU operation on health
- * Lighting and glare prevention
- * Work practices
- * Posture
- * Maintenance of VDU equipment and other related equipment
- * Health examinations and follow-up measures
- Exercises for VDU operation

5.0 USEFUL TIPS FOR VDU USER

VDU users can help themselves to minimise adverse health and safety adverse effect resulting from VDU work by taking the following listed practical tips:

5.1 Getting Comfortable



- Adjust your chair and VDU to find the most comfortable position for your work. As a broad guide, your forearms should be approximately horizontal and your eyes the same height as the top of the VDU.
- Make sure you have enough workspace to take whatever documents or other equipment you need.
- Try different arrangements of keyboard, screen, mouse and documents to find the best arrangement for you. A document holder may help you avoid awkward neck and eye movements.
- Arrange your desk and VDU to avoid glare, or bright reflections on the screen. This will be easiest if neither you nor the screen is directly facing windows or bright lights. Adjust curtains or blinds to prevent unwanted light.
- Make sure there is space under your desk to move your legs freely. Move any obstacles such as boxes or equipment.
- Avoid excess pressure from the edge of your seat on the backs of your legs and knees. A footrest may be helpful, particularly for smaller users.

5.2 Keying In



- Adjust your keyboard to get a good keying position. A space in front of the keyboard is sometimes helpful for resting the hands and wrists when not keying.
- Try to keep your wrists straight when keying. Keep a soft touch on the keys and don't overstretch your fingers. Good keyboard technique is important.

5.3 Using a Mouse

- Position the mouse within easy reach, so it can be used with the wrist straight. Sit upright and close to the desk, so you don't have to work with your mouse arm stretched. Move the keyboard out of the way if it is not being used.
- Support your forearm on the desk, and don't grip the mouse too tightly.
- Rest your fingers lightly on the buttons and do not press them hard.

5.4 Reading the Screen

- Adjust the brightness and contrast controls on the screen to suit lighting conditions in the room.
- Make sure the screen surface is clean.
- In setting up software, choose options giving text that is large enough to read easily on your screen, when you are sitting in a normal, comfortable working position. Select colours that are easy on the eye (avoid red text on a blue background, or vice-versa).
- Individual characters on the screen should be sharply focused and should not flicker or move. If they do, the VDU may need servicing or adjustment.

5.5 Posture and Breaks

- Don't sit in the same position for long periods. Make sure you change your posture as often as practicable. Some movement is desirable, but avoid repeated stretching to reach things you need (if this happens a lot, rearrange your workstation).
- Most jobs provide opportunities to take a break from the screen, e.g. to do filing or photocopying. Make use of them. If there are no such natural breaks in your job, your employer should plan for you to have rest breaks. Frequent short breaks are better than fewer long ones.

6.0 CHECKLIST FOR VDU USERS



With this checklist, the more "YES" answers there are, the better. This is particularly important for intensive computer users (more than 5 hours per day at the computer) as well as moderate computer users (3-5 hours per day at the computer). For "NO" answers the users have to make necessary adjustment or if such adjustment is beyond their control they have to inform their employer through the proper channel. Upon receiving such complains the employer have to conduct investigation and take the necessary corrective measures.

Item		Yes	No
1	Are the shoulders relaxed, elbows close to the sides, forearms roughly horizontal and wrists straight while using the keyboard? <i>If no, adjust the chair height and / or keyboard height.</i>		
2	Is there some place in front of the keyboard to allow the user to rest the wrists when not actively keyboarding? <i>If no, try to provide about 2-3 inches of space for the wrists and palms to rest on when not actively keyboarding. Also, ensure that the wrists and palms are not resting on sharp edges or similar pressure points.</i>		
3	While sitting, is the lower back well supported and remain in contact with the backrest of the chair while performing VDU work? <i>If no, consider the following: -adjust the backrest of the chair (i.e. adjust height, move backrest forward horizontally, adjust tilt) -try a pillow or strap-on back support to ensure that the back is in contact with the backrest -try a footrest to assist with sitting posture</i>		
4	While sitting, are the knees bent (about 90 degrees) and the thighs roughly horizontal? <i>If no, adjust the height of the chair accordingly.</i>		
5	While sitting, can the feet rest comfortably on the floor? <i>If no, the keyboard height may need to be lowered or a footrest may be required.</i>		
6	While seated at the workstation, are the ears, shoulders and hips lined up vertically? <i>If no, make necessary adjustments to the chair height, the angle of the backrest, keyboard height, viewing distance and / or the height of the VDU monitor.</i>		

Item		Yes	No
7	<p>Is the mouse or other pointing device located close to, and at about the same height as, the keyboard?</p> <p><i>If no, bring the mouse device closer to the keyboard, at about the same height. The upper arm should be close to the body and the elbow should be bent (about 90 degrees) and close to the sides. The wrist should be relatively straight, not deviated to the left or right or up or down.</i></p>		
8	<p>Is a document holder available for frequently used documents or reference materials?</p>		
9	<p>Are frequently used items such as files, telephone, etc. placed within easy reach (i.e. avoiding frequent above shoulder reaches or frequent twists or turns of the spine)?</p>		
10	<p>Does the user take frequent vision breaks for refreshing the eyes?</p> <p><i>If no, and the user often experiences dry, itchy, irritated, tired eyes and / or headaches and eyestrain, remember that for every 30 minutes of intensive VDU use, rest the eyes by glancing away from the monitor and focusing on a distant object for about 15 seconds before resuming work on the VDU.</i></p>		
11	<p>Does the user take physical breaks and move about frequently during the day (such as stretching exercises performed at the desk, moving or walking about to perform different tasks, changing sitting postures, etc.)?</p> <p><i>If no, remember that for every hour of intensive VDU use, try to take about 5 minutes away from the VDU to stretch, perform a different task, etc. Humans cannot remain in one position for hours on end without feeling aches and pains.</i></p>		
12	<p>Is the top of the VDU screen at about eye level or slightly lower?</p> <p><i>If no, and neck / shoulder discomfort is a problem, adjust the height of the monitor accordingly (ensure that the monitor is on a stable surface).</i></p>		
13	<p>Are the characters on the monitor easy to read?</p> <p><i>If no, and eyestrain / headaches are a problem, consider the following:</i></p> <ul style="list-style-type: none"> <i>-adjust the contrast / brightness levels on the monitor</i> <i>-check distance from the monitor (should be about arm's length)</i> <i>-check for sources of direct or reflected glare</i> <i>-check the level of overall illumination in the area</i> <i>-adjust font size, screen colors</i> 		

7.0 REFERENCES

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APPENDIX 1 : TYPICAL ARRANGEMENT OF VDU WORKSTATION

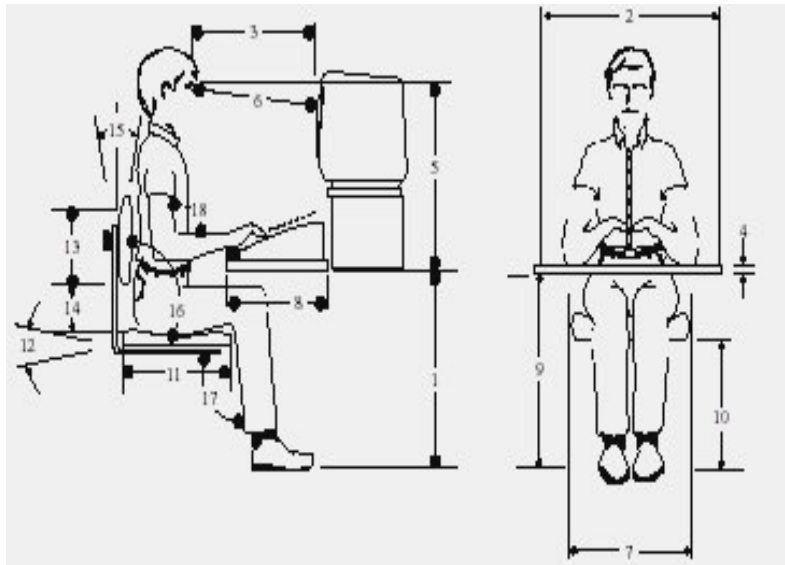


Figure 1: Dimension for seated VDU workstation (Adopted from: Oregon Occupational Safety and Health Division : Health and Safety Guidelines for Video Display Terminal in The Workplace, 2000)

1. **Height of work surface:** Adjustable from 650-750 mm
2. **Width of work surface:** At least 730 mm wide, but must have sufficient space for VDU and paperwork
3. **Viewing distance:** 400 – 730 mm.
4. **Thickness of work surface:** 25 mm
5. **Eyes in relation to screen:** Topmost active line of display should not be higher than user's normal line of sight. Employees who use bifocals or trifocals will require a lower height, which must be set individually.
6. **Viewing angle:** The viewing angle refers to the angle between the forward line of sight and the topmost active line of the display. It represents the normal direction of sight of the eyes. If measured, this angle is about 15 to 30 degrees. The topmost active line is the first line of the display that is regularly used, not the status bar or command line.
7. **Leg clearance width:** minimum 620 mm
8. **Leg clearance depth:** Minimum of 380 mm at knee level
9. **Leg clearance height:** Minimum of 600 mm
10. **Seat height:** Adjustable 350 – 450 mm
11. **Seat pan dimensions:** 330-430 mm length; minimum of 450mm width; "waterfall" front edge.
12. **Seat slope:** Adjustable 0-10 degrees forward and backward slope.
13. **Backrest size:** 380 – 500 mm high; 330 mm wide.
14. **Backrest height:** Adjustable 80-150 mm above seat.
15. **Backrest tilt:** 10 degrees forward and 5 degrees backward.
16. **Angle between backrest and seat:** Adjustable between 90-105 degrees.
17. **Angle between seat and lower leg:** 60-100 degrees.
18. **Angle of upper arm and forearm to keyboard:** Greater than 70 degrees and less than 135 degrees. Hands should be in a reasonably straight line with the forearm.

Notes