Legal Requirements for the Ergonomics and Usability of Workstations

Nigel Bevan*

The results of a recent Gallup poll demonstrated that more than 25% of office workers using display screens suffer from eye strain, tiredness, or pains in the back, shoulder and neck. After December 31, 1992 it will be a legal requirement in the UK, and the rest of Europe, that visual display equipment and workplaces meet minimum ergonomic requirements, and that the software is easy to use. National legislation to implement this is required by the European Directive on the Minimum Safety and Health Requirements For Work With Display Screen Equipment. As a consequence, employees will be entitled to a much more carefully designed working environment.

Potential Consequences

The most important provisions of the Directive are summarised in Box 1. They apply to workstations including the display screen, associated equipment, the chair, table and immediate working environment, when used habitually as a significant part of normal work. (Small data screens and portable equipment are excluded.) Many of the provisions cover well-established principles for the design of ergonomic work places, such as a clear image on the screen, a lack of reflections and a good working posture. There are some details which may prove contentious, for example chairs must be adjustable in height and "the seat back shall be adjustable in both height and tilt". The precise meaning of this clause will be a matter for legal interpretation, but taken literally it outlaws most of the latest style of moulded office chairs where the height of the back cannot be adjusted independently of the seat height!

The provisions for the operator/computer interface are a welcome acknowledgement of the importance of easy to use software, but consequently exclude all but the best existing software! For example if the Directive is fully implemented, it could make use of normal operating system interfaces such as MSDOS and UNIX illegal in the office, since they do not incorporate “the principles of software ergonomics”. Fortunately for MSDOS and UNIX users there are much better alternative interfaces available such as Microsoft Windows or OSF MOTIF which support most existing applications.

Employers are obliged to consult the workers, arrange work breaks, offer eye tests, and analyse workstations for potential problems. Unless employers plan well ahead, making these improvements could be a very costly exercise. The Directive applies to new installations from 1 January 1993, although employers have four years to adapt workstations put into service prior to that date.

Implementing the Directive
be implemented as new regulations under the Health and Safety at Work Act. Although it is the employer who has the responsibility for complying (and local authority environmental health officers who have the responsibility for enforcement in offices), in practice it will be manufacturers who are faced with the demand to provide equipment which conforms with the regulations. This may have a particular impact on suppliers of VDT hardware and software outside Europe, who may need to upgrade some aspects of their products if they are to continue to sell them in the European market.

The manufacturer's situation will be complicated by inevitable differences in interpretation of the Directive in legislation drafted by different member states. For instance the requirements for the "operator/computer interface" which are written in very general terms are difficult to test objectively and may be subject to a particularly wide range of interpretations. It is also not clear how the statement in the Directive that the minimum requirements "apply in order to achieve the objectives of this Directive" will be interpreted. This appears to provide a defence if it can be proved that although a workstation does not meet the requirements of the Directive, health and safety was not impaired. Major differences of interpretation may have to be resolved by a ruling of the European Court.

Some countries may produce legislation which goes beyond the minimum requirements. Although no decision has yet been taken in the UK, it is likely that legislation implementing the Directive will make reference to the forthcoming European standards based on ISO 9241: Ergonomic Requirements for Office Work with Visual Display Terminals (Box 2). The minimum requirements of the Directive are similar, but not identical to, the requirements of the relevant parts of ISO 9241 which are given in much greater detail. It would have been simpler if the Directive had made direct reference to these parts rather than containing its own requirements. However, not all the ISO parts are complete, and the contents of ISO 9241 are agreed by experts in national standards bodies, while the contents of the Directive are approved at a political level in the European Community.

CEN TC122/WG5 is responsible for producing the European version of ISO 9241. The work is supported through a mandate from the European Commission (which is likely to be extended to include the user interface standards produced by ISO/IEC JTC1/SC18/WG9). Standards only become mandatory if they are cited in national legislation (such as legislation required by a European Directive). National legislation can only make reference to national standards, but national administrations are obliged to adopt European standards in order to reduce barriers to trade.

Other Directives

There are two other directives which can also apply to the ergonomics of workstations. When used outside the office, they may be classified as machinery, in which case the legislation implementing the Machinery Directive (see Box 3) will apply. This requires suppliers to provide machinery which meets
The Supplier's Directive (Box 4) requires that the technical specifications used for procurement by public bodies must make reference to relevant European standards. These could include ergonomic and user interface standards once these have been adopted by CEN, provided that they have explicit conformance requirements.

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Box 1 - European Directive on the Minimum Safety and Health Requirements for Work With Display Screen Equipment

The Directive applies from 1993 for new workstations, and from 1997 for existing workstations.

The equipment requirements include:

- A screen which is adjustable in height, swivel and tilt, and has a stable, clear image.

- A separate tiltable keyboard with a matt surface and legible key markings.

- A chair which is adjustable in height with a back adjustable in height and tilt, and a footrest available on request.

The environmental requirements include:

- A workplace layout which prevents any disturbing glare and reflections.

- Associated equipment should not distract attention or disturb speech.

- Radiation should be reduced to negligible levels regarding protection of safety and health.

The operator/computer interface requirements include:

- Software must be suitable for the task.

- Software must be easy to use and where appropriate adaptable to the user’s level of knowledge or experience.

- The principles of software ergonomics must be applied.

There are additional provisions stipulating work breaks, giving workers the entitlement to an eyesight test, and requiring consultation, participation and training of workers.

The UK legislation to implement the Directive will be drafted by the Health and Safety Executive, and a consultation document will be issued later this year. For more information contact Nigel Watson at the HSE, telephone 071-243 6116.

**Box 2 - Ergonomic Standards to be Adopted by CEN**

ISO 9241 - Ergonomic Requirements for Office Work With Visual Display Terminals (VDTs):

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*title not finalised

IS = International Standard
DIS = Draft International Standard
CD = Committee Draft (circulated for national comment and vote)
WD = Working Draft (not finalised)
P = Planned

ISO/IEC JTC1/SC18/WG9

Information Technology - User System Interfaces for Text and Office Systems

- Cursor Control: CD late 91
- Objects and Actions: CD
- Icons: CD late 91

*Copies of standards (IS and DIS) can be obtained from the BSI on 0908 221166. CDs are available to committee members and subscribers to the BSI BITS service.*
Box 3 - Machine Safety Directive

The Directive is being phased in from 1993 to 1995, and requires suppliers to provide machinery (including display screens and associated software used outside the office) which satisfies essential health and safety requirements, which include: "interactive software between the operator and the command or control system of a machine must be user friendly". Machinery is defined as an assembly of linked parts, at least one of which moves, joined together for a specific application.


Box 4 - Supplier's Directive

The Directive (which is already in force) requires that the technical specifications used for procurement by public bodies must make reference to relevant European standards to which conformity can be established. (When appropriate this should include ergonomic and user interface standards.)