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Ergonomic requirements for office work with visual display terminals (VDTs) —

Part 2:
Guidance on task requirements

Exigences ergonomiques pour travail de bureau avec terminaux à écrans de visualisation (TEV) —

Partie 2: Guide général concernant les exigences des tâches

Reference number
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 9241-2 was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Sub-Committee SC 4, *Signals and controls*.

ISO 9241 consists of the following parts, under the general title *Ergonomic requirements for office work with visual display terminals (VDTs)*:

— *Part 1: General introduction*

— *Part 2: Guidance on task requirements*

— *Part 3: Visual display requirements*

— *Part 4: Keyboard requirements*

— *Part 5: Workstation layout and postural requirements*

— *Part 6: Environmental requirements*

— *Part 7: Display requirements with reflections*

— *Part 8: Requirements for displayed colours*

— *Part 9: Requirements for non-keyboard input devices*

— *Part 10: Dialogue principles*

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— *Part 11: Usability statements*

— *Part 12: Presentation of information*

— *Part 13: User guidance*

— *Part 14: Menu dialogues*

— *Part 15: Command dialogues*

— *Part 16: Direct manipulation dialogues*

— *Part 17: Form filling dialogues*

Introduction

The introduction of a VDT-based information processing system can have effects on the structure, function and physical environment of an organization. Patterns of interaction can change, individual, organizational and technical interdependencies can change, and the contents of jobs can change. These changes should affect the performance, health and well-being of the individuals involved in a positive way.

The application of ergonomic principles to a VDT-based information processing system is essentially the integration of task design with the design of the hardware and software and the work environment.

Ergonomic requirements for office work with visual display terminals (VDTs) —

Part 2:
Guidance on task requirements

1 Scope

This part of ISO 9241 provides guidelines to users of VDT-based information processing systems with reference to office tasks. This guidance is relevant to both the organization implementing the system and the people using the equipment. The guidance should be applied in accordance with local, regional or national agreements and regulations.

The objective of this part of ISO 9241 is to enhance the efficiency and well-being of the individual user by applying ergonomics knowledge in the light of practical experience, to the design of tasks. The ergonomics principles concerned are set out in ISO 6385.

The characteristics of the visual display, and the control, workplace and environmental requirements are specified in other parts of ISO 9241. This part of ISO 9241 does not address software and dialogue design.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 9241. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9241 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 6385:1981, *Ergonomic principles in the design of work systems.*

3 Definitions

For the purposes of this part of ISO 9241, the definitions given in ISO 6385 apply.

4 Task design

4.1 Aims

In applying ergonomics principles to the design of tasks for users of VDT-based information processing systems, the objective is to provide for optimal working conditions with regard to human well-being, safety, and health, taking into account technological and economic efficiency.

Appropriately designed tasks should:

— facilitate task performance;

— safeguard the users' health and safety;

— promote their well-being;

— provide opportunities to develop their skills and capabilities with respect to the tasks concerned.

In particular the following should be avoided as far as possible:

— overload or underload, which can lead to unnecessary or excessive strain or fatigue, or to errors;

— undue repetitiveness, which can lead to sensations of monotony, satiation and boredom, and to dissatisfaction;

— undue time pressure;

— working alone without opportunities for social contact.

4.2 Characteristics of well-designed tasks

At the same time as contributing to the main purpose of the VDT-based information processing system, an appropriate and efficient design for office tasks should:

— recognise the experience and capabilities of the user populations;

— provide for the application of an appropriate variety of skills, capabilities and activities;

— ensure that the tasks performed are identifiable as whole units of work rather than fragments;

— ensure that the tasks performed make a significant contribution to the total function of the system which can be understood by the user;

— provide an appropriate degree of autonomy to the user in deciding priority, pace and procedure;

— provide sufficient feedback on task performance in terms meaningful to the user;

— provide opportunities for the development of existing skills and the acquisition of new skills with respect to the tasks concerned.

4.3 Specifying design requirements

In order to achieve the objectives and characteristics of a well-designed task which are set out in 4.1 and 4.2, it is necessary to consider the specific purposes of the system and characteristics of the users. In this way it will be possible to take account of the interdependencies which arise in particular organizational settings.

There is no single best way of designing tasks to take account of user requirements, efficiency, health and well-being. The organization which is implementing the system should engage in whatever activities are appropriate to the identification of task characteristics which will meet the criteria.

The characteristics listed in 4.2 should be used to evaluate and compare alternative task designs. In formulating new versions of a task, positive attributes of the task should be sustained or enhanced when compared with existing tasks.

An important part of the process of establishing the task requirements will be to obtain reliable and valid data directly from users. There are many ways in which this can be done, for example:

a) by observational studies;

b) by psychometric assessment on standardized scales;

c) by the use of questionnaires;

d) by interviews;

e) by consultation.

There are three aspects of tasks involving VDT-based information processing systems which are particularly significant in terms of their influence on the criteria for good task design. These aspects are:

f) the length and distribution of time spent operating the system;

g) discretion, i.e. autonomy in choosing whether and how to use the system;

h) dependence, i.e. the degree to which the VDT-based information processing system as a work tool is essential to the performance of the task.

It should be noted that there are different optimal ranges for each of these three aspects, and that their interdependencies have a particularly strong effect on the aims and characteristics set out in 4.1 and 4.2.

In the course of designing the specific task, currently existing conditions should be determined with a view to predicting future requirements. Where there is insufficient information for these decisions to be made on the basis of current experience, it will be necessary to gather the necessary data from tests in prototypes, simulations and pilot studies.

To ensure that the process of task design is effective, plans for design and evaluation should be developed sufficiently in advance of system selection and installation.

4.4 Implementation planning

4.4.1 General

A proper implementation plan should be developed to anticipate and address the physical and psychological changes that will take place in the organizational environment before, during and after introduction of a new or modified VDT-based information processing system.