

# ERGONOMICS

*Ergonomics is the study of the relationship between people and their work environment. It is used to prevent or reduce workplace ill-health and accidents.*

Disability campaigners have always advocated that people are not "disabled", people are simply different and it is the environment that disables. Ergonomics takes the same line.

Ergonomic factors are important to the risk assessment process and are central to any "suitable and sufficient" risk assessment.

There are many ways that people interact with, and within, their work environment and all that range of interactions are ergonomic factors the risk assessment must cover.

## Definition

In August 2000 The Council of the International Ergonomics Association adopted a "definition" of the discipline (the science of ergonomics). The definition says that ergonomics has these "domains":

*Physical ergonomics* which relates to physical activity, such as, working posture, repetitive movement, WRULDs, manual handling, workplace design, workload and pace of work.

*Cognitive ergonomics* is about our mental processes, mental workload, human-computer interaction, work stress, training, decision making and skill levels.

*Organizational ergonomics* is about organisational structures, policies and processes, for example, communication, human resource management, working hours, systems of work, home-working (or tele-working) and quality management.

## Hazardous practice

Any work done in awkward postures, at excessive speed or with excessive effort will result fatigue and discomfort. These factors result in damage to tendons, ligaments, muscles, spinal cartilage,

nerves, and blood vessels; commonly referred to as musculoskeletal disorders. And because ergonomics is about the relationship between a worker and their work, a person's susceptibility to injury will vary because of differences in age, physique, stature, gender, mental capacity etc.

An ergonomically sound job will not injure or stress the worker or make a job more likely to result in accidents. Hazardous factors, in addition to the well documented ones of posture, repetitive motion, contact stress and vibration, that are properly the subject of an ergonomic approach to risk assessment are:

- ▲ workplace layout
- ▲ workstation design
- ▲ workplace environment
- ▲ tools and equipment
- ▲ personal comfort.

## Workplace layout

Workplace lay-out is often unplanned and haphazard. The "It is like that because that's where the power points are" syndrome. In a workplace where no thought has been given to ergonomics, needless journeys are made, people have bruises on their shins, work in the dark, have bumps on their head and can't hear what's being said to them. They have an unsafe system of work.

Jobs should be designed to minimise stair journeys, ensure easy access to workstations, have comprehensible communication whether aural or visual, have ease of access to storage etc. The workplace should fit the tasks that are carried out in it and workers must not fill the hap-hazardous gap between "task" and "fit for purpose".

## Workstation design

When the law refers to a workstation it is not simply meaning a computer workstation. A toolmakers bench, a checkout operators till-point, a telephone support workers desk and a place on an assembly line are all workstations and workstations must be designed to "fit" workers rather than workers having to

adopt postures to use the workstation. e.g. BBC journalists are negotiating with their employer regarding the design of editing suites.

## Workstation environment

Temperature variations have an effect on our bodies, high temperatures will increase the rate at which we will fatigue. Cold temperatures decrease blood flow and so affects muscle strength, and dexterity.

Light levels in a workplace may be too dark or too bright for the job to be done safely. This and other lighting factors, i.e. flicker, may cause eye strain or worse.

Humidity levels are important. If too dry body surface fluids quickly evaporate and cause "dry eye" and "dry skin" causing discomfort which is intrusive. This may lead to lack of concentration and increase the possibility of personal error. There is also the increased chance of infection in these circumstances. If too wet, perspiration does not evaporate and leads to "slippy grip", This discomfort is also intrusive into concentration.

Ventilation (filtration, air quality and air movement), noise and, for outdoor workers, weather conditions are also subject of to ergonomic assessment.

## Tools and equipment

Tools that span between the handles e.g. pliers or cutters, or bulky barrelled tools, such as some grease guns must be avoided. Spans above 2 inches must not be used if hand pressure has to be applied. Tools that need workers to apply rotational force with a bent wrist should not be used. These can be replaced with ergonomically designed tools or power tools.

Equipment control panels must be "fail safe" (even if the worker gets it wrong no detriment occurs). Switches and control layouts must be easily understood and all switches, control buttons and display information must be easily accessible when the worker has a comfortable working position.

Computer software comes into this category too. Probation officers successfully

negotiated an ergonomic analysis of case recording software.

### Personal comfort

Discomfort at work can be physical or emotional; experiencing either will precipitate an increase in workplace stress. Discomfort at work is a sure indicator that a risk assessment should be carried out or reviewed. In this circumstance an ergonomic analysis must be part of the risk assessment.

### Basic ergonomic check-list

- ▲ Are you satisfied with how you do your job tasks?
- ▲ Are your co-workers satisfied with those tasks too?
- ▲ Can you see and hear all that you need to do your job?
- ▲ Do you understand the information you are presented with while doing your job?
- ▲ When something goes wrong at work is it put right simply?
- ▲ Do you have aches, pains or discomfort when you have been doing your job?
- ▲ Can you suggest improvements to the way your job is currently done?
- ▲ Are your colleagues of a similar opinion?
- ▲ Are there high levels of sickness among people doing your job?

### Ergonomics and risk assessment

There will be occasions when workers need to insist that a professional ergonomist do an analysis but simply involving workers in job and workstation design will often do the trick.

In the Management of Health and Safety at Work Regulations, the Approved Code Of Practice (ACOP), paragraph 15 to Regulation 3 (duty of employer to

carry out risk assessments) says: "The risk assessment process needs to be practical and take account of the views of employees and their safety representatives who will have practical knowledge to contribute".

The Health and Safety Executive (HSE) in their publication "Understanding ergonomics at work" (INDG90(rev2)) identify the following work hazards as needing ergonomic assessment at the core of the risk assessment.

- ▲ All work involving display screen equipment (not just computer workstations)
- ▲ All work involving manual handling
- ▲ All work that generates work-stress, including:
  - work demands that are too high (or too low).
  - workers having no say in how their job is organised
  - poor management support
  - conflicting demands e.g. High productivity and quality.

It also emphasises that shift scheduling, overtime and work breaks (including breaks between work shifts) and the home (life) – work balance should be seen as matters of ergonomic analysis.

The HSE says: "these problems may lead to tiredness or exhaustion, which can increase the likelihood of accidents and ill-health."

### The law

Section 2(2) of the Health and Safety at Work Act requires "the provision and maintenance of plant and **systems of work** that are, so far as is reasonably practicable, safe and without risks to health."

The Management of Health and Safety at Work regulations require employers do "suitable and sufficient" risk assessments on all aspects of health and safety that may affect their employees' health, safety or welfare.

Improvements to work should be made. Where it applies, the Disability Discrimination Act (DDA) 1995 requires "reasonable adjustments" are made to help injured workers work, although this should be general practice by employers whether the DDA applies or not. Alternative work should be made available where necessary to help prevent further injury. Advice on alternative work equipment that might help fulfil the "reasonable adjustments" requirement can be sought from the Dept. of Work and Pensions "Access to work" scheme.

If none of the above can be achieved then rest away from work may be the only solution. Dismissal of those injured should definitely not occur and could lead to the employer getting in trouble with the law, having to pay compensation. If all else fails and it is appropriate, early retirement on medical grounds may be in the employee's best interests and can be explored.

Safety reps should negotiate an RSI prevention policy covering the above.

### Further information

- 1) International Ergonomics Association  
[www.iea.cc/ergonomics](http://www.iea.cc/ergonomics)
- 2) Ergonomics in Australia  
[www.ergonomics.com.au/pages/400\\_useful\\_info/720\\_useful\\_links.htm](http://www.ergonomics.com.au/pages/400_useful_info/720_useful_links.htm)
- 3) HSE  
[www.hse.gov.uk/pubns/indg90.pdf#search=%22understanding%20ergonomics%20at%20work%22](http://www.hse.gov.uk/pubns/indg90.pdf#search=%22understanding%20ergonomics%20at%20work%22)
- 4) Hazards Magazine  
[www.hazards.org/haz75/voodooscience.htm](http://www.hazards.org/haz75/voodooscience.htm)
- 5) Chartered Institute of Building Service Engineers (for standards on the built environment)  
[www.cibse.org/](http://www.cibse.org/)

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Hampstead Town Hall Centre  
213 Haverstock Hill, London NW3 4QP  
Tel: 020 7794 5999 Fax: 020 7794 4702  
Email: [mail@lhc.org.uk](mailto:mail@lhc.org.uk) Website: [www.lhc.org.uk](http://www.lhc.org.uk)  
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