



Safety Human Factors Information

Prepared by WG-16 Worker Safety

Safety Info HF 12/20

Task

Human Factors in Ergonomic Design



Human Factors Engineering is the application of human factors to the design and development of systems and services.

Ergonomics is about ensuring a good 'fit' between people and the things they use. People vary enormously in height and weight, in physical strength, in ability to handle information and in many other ways. Ergonomics uses information about human abilities, attributes and limitations to ensure that our equipment, work and workplaces allow for such variations.

Learning more about human factors in ergonomic design.

If the answer to any of the questions below is 'no', then you need to take action

Human Factors Engineering (HFE)

Are any of the following aspects considered in the design of areas where people work or of the systems, services and equipment they use:

1.
 - Layout of controls and operating panels? ☐
 - User interfaces to computing facilities (for example screen designs; provision of functionality to the appropriate users)? ☐
 - Location and layout of workstations or consoles ☐
 - Workplace layouts (for example control rooms; maintenance spaces, plant layout)? ☐
 - Work methods and manual handling (for example cylinder handling and lifting)? ☐
 - Design, location and layout of maintained equipment (for example) maintenance access; ease of maintenance)? ☐

Health Hazards

Has the potential for the following hazards been identified and have measures been included to eliminate or mitigate them and protect personnel from them:

2.
 - Chemical hazards? ☐
 - Electrical hazard? ☐
 - Mechanical injury? ☐

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- Musculoskeletal injury (for example heavy lifting, repetitive movement)? ☐
- Extreme heat or cold? ☐
- Optical hazards? ☐
- Electro-magnetic radiation? ☐
- Vibration? ☐
- Noise? ☐
- Thermal comfort? ☐
- Radiation? ☐
- Stress? ☐
- Biological hazard? ☐

Safety Management System ☐

- 3.
- Have human factors engineering input been included in safety management activities? ☐
 - Have ergonomics been considered in job hazard analyses (including safety critical tasks)? ☐
 - Has the potential for human failure been identified? ☐
 - Has the impact of external factors on human performance been identified (for example environment workload)? ☐
 - Has the potential for equipment misuse or abuse been identified? ☐

Human factors in design

The design of plant and equipment can have a large impact on human performance, health and safety. Designing tasks, equipment and work stations to suit the user can reduce human error, accidents and ill-health. Failure to observe ergonomic principles can have serious consequences for individuals and for the whole organisation. Effective use of ergonomics will make work safer, healthier and more productive.

The earlier that consideration is given to human factors and ergonomics in the design process, the better the results are likely to be. However, it is important to use human factors and ergonomics expertise correctly and at the right time. People with knowledge of the working processes and of the worker should be involved. For that reason, worker involvement is key to designing operable and maintainable plants and systems.

Poor design contributes to work-related ill-health and has also been found to be a root cause of incidents. Further guidance and reading can be found in the Useful Reference Information [1-7].¹

Ergonomics

Knowing that you have an ergonomic problem

If you look at the circumstances surrounding incidents and near misses in your workplace you may find problems such as people being:

- unable to see important displays or to reach controls;
- unable to work in an ergonomic position;
- overloaded with too much information at one time;
- inattentive because there is too little to do;

¹ References are shown by bracketed numbers and are listed in order of appearance in the reference section.