

Introduction

These briefing notes are aimed primarily at supervisors and managers, but anyone who works in the petroleum or allied industries should find them of interest. If supervisors or managers become aware that they or their workforce are experiencing any of the problems described, they should be able to take practical steps to help solve them by gathering information and drawing this to the attention of higher management, with a view to working together to make improvements.

Introduction

Understanding how human factors (HF) influence human performance is increasingly important as a management aid. There are many reference books and websites concerned with HF and, although the terms are in common use in industry, it can be difficult to easily find out what a particular HF issue is really about. The Energy Institute (EI) briefing notes provide a useful introduction to each HF subject and refer to the role of managers in organising tasks and work conditions. They point to useful data and methods for improving performance and:

- Introduce each subject with a definition.
- Illustrate problem areas and solutions using case studies.
- Provide a checklist of questions to gauge whether your company has a problem.
- Suggest what company/management can do to address the specific HF issue.
- List references/useful sources of information.

2nd edition of the briefing notes

The subjects described in the original briefing notes issued in 2003 were suggested in a workshop and by UK Health and Safety Executive (HSE) inspectors based on the issues they continued to find in industry. A subsequent survey of those with an interest in these subjects produced 190 responses and suggested some new subjects and ideas for changes leading to the latest version of the briefing notes.

What do the briefing notes cover?

Each briefing note provides an overview of a HF issue that continues to cause problems in a wide range of industries. It also includes an overview of some useful HF methods. There are 20 briefing notes:

1. Introduction
2. Alarm handling
3. Organisational change
4. Maintenance
5. Fatigue
6. Safety critical procedures
7. Training and competence
8. Ergonomics
9. Safety culture
10. Communications
11. Task analysis
12. Human error and non-compliance
13. Human reliability analysis
14. Behavioural safety
15. Incident and accident analysis
16. Human factors integration
17. Performance indicators
18. Leadership
19. Pressure and stress
20. Occupational safety vs. process safety

What can I do about it?

For each HF issue:

1. Find out whether there is a problem in the organisation.
2. Draw findings to management's attention. Ideally, conduct 1 and 2 as a joint effort with management's input and support.
3. Seek to eliminate problems at source:
 - Remove or 'engineer out' the problems.
 - Look for 'quick wins' – easily achievable remedies.
 - Seek expert help when required – the Institute of Ergonomics and Human Factors provides a directory of consultants (Reference 1).

Ideas for gathering information:

- a. Conduct a brief survey – ask people face to face or using a questionnaire if they have a problem with, for example, alarms, fatigue, procedures, competence, etc.
- b. The briefing notes have a self-assessment checklist that can be used to create a paper or email based survey. If more ideas for questions to ask are needed, use the references shown in the briefing note.
- c. Gather physical evidence of HF problems where possible: photographs, printouts, logs, incident reports, etc.

It is important to consider the right HF topics at the right time in a project lifecycle. For example, it will be difficult or impossible to develop procedures and training at the early concept stage of a project or to plan maintenance until the physical design of plant and facilities is decided. Some factors interact with others so that each one should not be considered in isolation from the others but as a whole.

Descriptions of human factors

HF refers to all of those things that could affect human performance in a task. The word ergonomics is used to describe broadly the same subject. HSE provides a useful guide to HF in its publication *Reducing error and influencing behaviour* and on their website (Reference 2). HSE describes HF as the:

"...environmental, organisational and job factors, and human and individual characteristics which influence behaviour at work. Careful consideration of human factors can improve health and safety by reducing the number of accidents and cases of ill-health at work. It also provides considerable benefits for business by reducing the costs associated with such incidents and increasing efficiency."

HSE emphasises three basic factors: the job; the individual; and the organisation.

The International Association of Oil and Gas Producers (OGP) has also produced a useful pamphlet entitled *Human factors – a means of improving HSE performance* (free download from OGP website, Reference 3), which describes three similar factors to HSE: facilities and equipment; people; and management systems.

Benefits of human factors

Despite the best intentions of managers and workforce, poor front line human performance is responsible for a large proportion of process safety and personal safety incidents at work (although the human contribution to successfully meeting an organisation's objectives is also considerable).

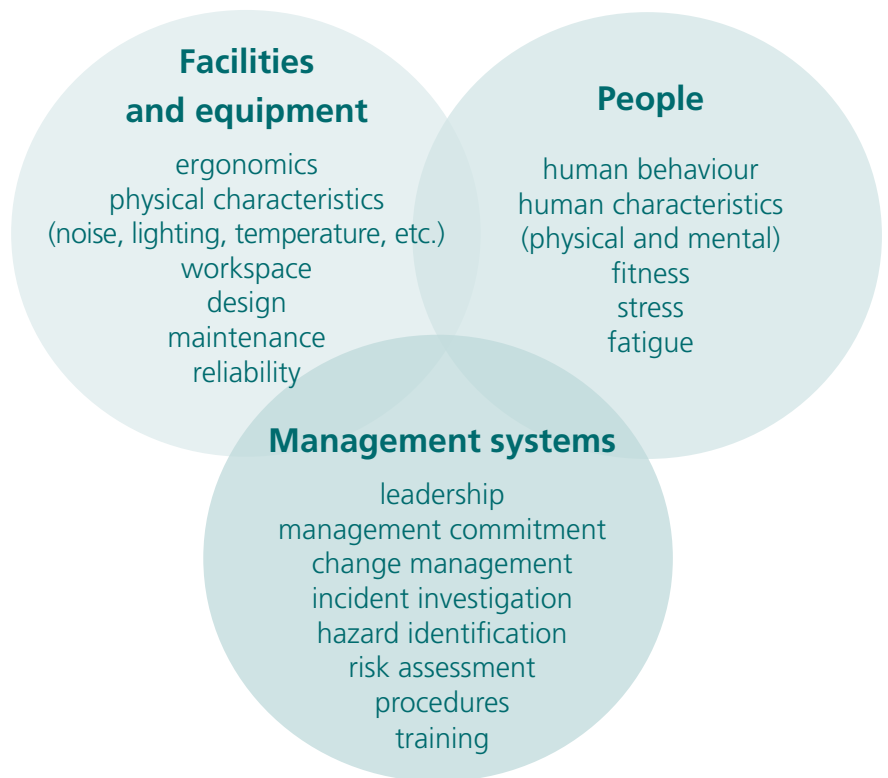
The HSE definition above also refers to organisational factors and describes some of the benefits of applying HF practices in the workplace, including accident reduction. But it may not be clear who benefits and how:

- The workforce benefits by having: tasks matched to their capabilities and characteristics; adequate support from colleagues and supervisors; clear procedures and systems of work; appropriate training and competence development; and from well-designed shift and rest patterns, workplaces, systems and tools.
- Management benefits by the above arrangements leading to: increased productivity; better quality of work; reduced errors and accidents; completion of projects on time and budget; and reduced costs.

Integration of human factors

It is important that HF considerations are included in specific projects but, perhaps more importantly, that they are integrated into an organisation's everyday approach to managing people.

A parallel can be drawn here with quality assurance (QA) that was formerly seen in many companies as useful but separate from day to day management. In the best performing companies, however, QA and other standards form part of how they do business. To achieve a similar integration of HF requires total commitment from the organisation's most senior managers.



Adapted from Reference 3.

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References

1. The Institute of Ergonomics and Human Factors <http://www.iehf.org/>.
2. HSE (1999), *Reducing error and influencing behaviour*, HSG48, HSE Books, <http://www.hse.gov.uk>.
3. OGP, *Human Factors – A means of improving HSE performance*, <http://www.ogp.org.uk>.

Further reading

- Crowl, DA (ed) (2007) *Human factors methods for improving performance in the process industries*, Center for Chemical Process Safety (CCPS), Wiley-Interscience.

The following websites are useful sources of further information on ergonomics/HF:

- Step Change In Safety website <http://www.stepchangeinsafety.net>.
- The Ergonomics Information Advisory Centre, based at Birmingham University <http://www.eee.bham.ac.uk/eiac>.
- The International Association of Oil and Gas Producers (OGP) <http://www.ogp.org.uk>