Human factors in safety management systems

Introduction

A safety management system is the organisation and arrangements established by a transport operator to ensure the safe management of its operations. It encompasses safety arrangements at all levels of the company and provides a process by which risks can be assessed and controlled. Organisations need to understand how human factors influence behaviour and consequently safety performance. This is especially important when an organisation attempts to reduce risk with operational solutions rather than by designing out the problem, for example supplying operators with ear defenders rather than reducing the noise at the source.

Case study

The inquiry into the Clapham rail crash found that maintenance working practices had degraded to the point where it had become routine not to use the prescribed method for certain tasks. Poor supervision and problems with training and testing mean that that this situation was allowed to persist.
The structure of a safety management system

The main elements of a health and safety management system are shown here (taken from the Health and Safety Executive guide ‘Successful Health and Safety Management (HSG65)’):
This comprises the following elements:

- Policy: Effective health and safety policies set a clear direction for the organisation to follow
- Organising: An effective management structure and arrangements are in place for delivering the policy
- Planning: There is a planned and systematic approach to implementing the policy through a safety management system
- Measuring performance: Performance is measured against agreed standards to reveal when and where improvement is needed
- Auditing and Reviewing performance: The organisation learns from experience and applies the lessons

**Human factors elements within the safety management system**

The HSE guide ‘Reducing Error and Influencing Behaviour’ (HSG48) identifies four key areas where there are opportunities to look at the impact of human factors:

- Risk assessments
- Investigations of accidents, incidents and near misses
- Design and procurement of work equipment, systems and workplaces
- Person-centred aspects of job design, such as the management of shiftwork and fatigue, communication and safety culture

Human factors refer to environmental, organisational and job factors, and human and individual characteristics that influence behaviour at work in a way which can affect health and safety. In considering the opportunities listed above, you should be thinking about all elements of the behaviour of the human in the system, broken down into three elements: the individual, the job and the organisation, as shown here:
The job
This directly influences individual performance and the control of risks. Tasks should be designed according to human factors principles to take account of the limitations of human performance. For example, as part of your safety management system, have you:

- Identified and analysed critical tasks?
- Evaluated the employee’s decision-making needs?
- Evaluated the optimum balance between human and automatic systems?
- Applied ergonomic principles to the design of equipment displays?
- Thought about the design and presentation of procedures and instructions?
- Considered available guidance for the design and control of the working environment including the workspace, access for maintenance, lighting, noise and thermal conditions?
- Provided the correct tools and equipment?
- Scheduled work patterns and shift organisation to minimise impact on health and safety?
- Considered how to achieve efficient communications and shift handover?
- Considered whether the workload on the operators is acceptable?

Personal factors
The attributes that employees bring to their jobs may be strengths or weaknesses in relation to the demands of a particular task. They include both mental and physical abilities. For example, as part of your safety management system, have you:

- Drawn up job specifications looking at age, physique, skill, qualifications, experience, aptitude, knowledge, intelligence and personality?
- Matched skills and aptitudes to job requirements?
- Set up personnel selection policies and procedures to select appropriate individuals?
- Implemented an effective training system?
- Considered the needs of special groups of employees?
- Set up monitoring of personal performance on safety for safety critical staff?
- Provided fitness for work and health surveillance where this is needed?
- Provided counselling and support for ill health or stress?

Organisational factors
Organisations need to establish their own positive safety culture which promotes employee involvement and commitment at all levels. For example, as part of your safety management system, do you have:

- An effective health and safety management system?
- A positive safety climate and culture?
- Arrangements for the setting and monitoring of standards?
- Adequate supervision?
- Effective incident reporting and analysis?
• Learning from experience?
• Clearly visible health and safety leadership?
• Suitable team structures?
• Efficient or effective communication systems and practices?
• Adequate staffing levels?
• Suitable work patterns?

Further information

• Good practice and competence in strategic safety management [PDF 206kb]
• Occupational health and safety management systems guide BS 8800: 2004
• Reducing error and influencing behaviour (HSG 48) HSE Books ISBN 0-7176-2452-8
• Successful health and safety management (HSG 65) HSE Books ISBN 0-7176-1276-7
• The yellow book

To ensure changes made to the railway contribute to improved safety an electronic version of the yellow book has been made available. It includes details of relevant legislation, standards, regulatory authorities, professional institutions and other information.