

Safety culture – the way forward

Our industrial psychology contributors Mark Fleming and Ronny Lardner explore current approaches to safety culture improvement

IN HIGH reliability industries, there has been an increasing recognition of the importance of the cultural and behavioural aspects of safety management. Investigations into major disasters such as Piper Alpha, Zeebrugge, Flixborough, Clapham Junction, and Chernobyl have revealed that complex systems broke down disastrously, despite the adoption of the full range of engineering and technical safeguards, because people failed to do what they were supposed to do. These were not simple, individual errors, but malpractices that corrupted large parts of the social system that makes organisations function.

The main focus over the past 150 years has been on improving the technical aspects of engineering systems to improve safety, and these efforts have been very successful. This success can be seen by the low accident rates in the majority of safety critical industries – however, it does appear that a plateau has now been reached. As the frequency of technological failures in industry has diminished, the role of human behaviour has become more apparent, and safety experts now estimate that 80–90% of all industrial accidents are attributable to 'human factors'. It is now widely accepted that the most effective

way to further reduce accident rates is to address the social and organisational factors that influence safety performance. Management has come to realise that the general likelihood of an

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accident occurring in their plant depends not just on the actions of individual employees but on the safety culture of the organisation. The CBI¹ defines safety culture as "the way we do things around here".

The term 'safety culture' appears to have arisen out of the report on the 1986 Chernobyl disaster, where the errors and violations of the operating procedures that contributed to the accident were seen by some as being evidence of a poor safety culture at the plant. The Advisory Committee for Safety in Nuclear Installations describes safety culture as: "the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine commitment to, and the style and proficiency of, an organisation's health and safety management". Organisations with a positive safety culture are characterised by "communications founded on mutual trust, by shared perceptions of the importance of safety and by

the efficacy of preventive measures".²

The identification of a poor safety culture as a factor contributing to an accident has led to an increasing number of studies being carried out to investigate safety culture in high hazard industries, and a number of books have recently been published discussing the factors which underpin safety culture.^{3,4} In parallel with these scientific investigations, individual companies and industry groups have embarked on a number of safety culture improvement initiatives, for example the Step change initiative in the offshore oil industry.

Most of the studies that have specifically attempted to measure safety culture have concentrated on measuring 'safety attitudes', with positive attitudes to safety being considered to be the

Attitudes and perceptions

The attitudes and perceptions that have been associated with organisations that have low accident rates^{2,3,5} include:

- management commitment to safety;
- safety having priority over production;
- effective safety supervision ;
- participative and humanistic management style;
- status of safety measures;
- effective and efficient rules and procedures;
- low levels of risk taking behaviour;
- shared perception of the relative risks;
- good organisational learning;
- a proportion of the workforce recruited, maintained and promoted because they work safely.



▲ Aircraft safety relies on an interdependent approach

most important aspect of a 'good' safety culture. For example a study carried out in the UK offshore oil industry³ assessed attitudes to risk and safety among 722 workers on ten offshore installations. They used focus groups as a forum for workers to air their views and discuss issues concerning risk and safety. Statements from these discussion groups provided the basis for a questionnaire, which was then distributed to all offshore personnel on the participating installations. They found major differences in the attitudes and perceptions of different occupational groups, according to supervisor status, contractor versus operator, age and experience. Different groups of workers clearly had different perceptions, beliefs and attitudes with respect to safety. Differences in risk perception and attitudes to safety were linked with safety behaviour, which in turn was linked to prior accident involvement.

Positive attitudes

The large number of research teams investigating safety culture has led to the development of an equally large number of measurement instruments, the majority of which use some form of

self-completion questionnaire. Various scales purporting to measure different aspects of safety culture (such as risk perception and job satisfaction) are a common feature. While they all tend to measure attitudes to safety, they have often been developed independently by each research team and so contain different statements, which appear to be measuring similar concepts. This makes it difficult to produce a definitive list of the features of a positive safety culture. The common elements are summarised in the box.

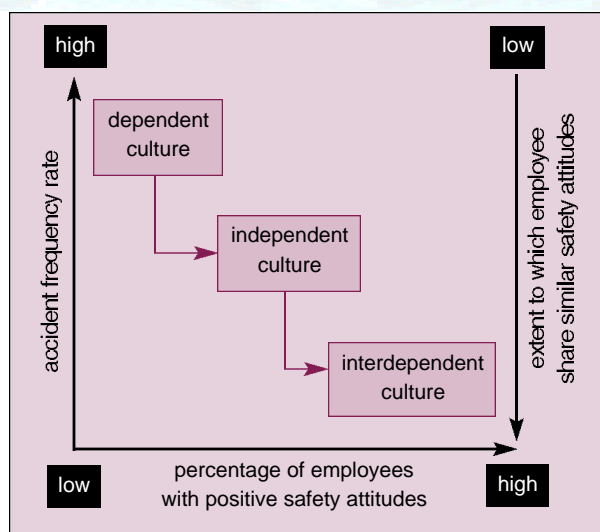
With the measurement aspect largely addressed, the current challenge is how to improve safety culture. A criticism made by some safety professionals is that safety culture audits tell them what is wrong but provide little insight into how to improve the situation.

Safety culture improvement can be better understood by using a model to represent the process. A three-stage

model developed by an offshore operating company has been adapted (see diagram). This model is useful as organisations can identify their current stage and identify actions to move them to the next stage. The three stages in this model are:

- dependent;
- independent;
- interdependent.

In a dependent culture, the emphasis is on management and supervisory control, with extensive use of discipline to enforce safety measures. There is a heavy reliance on written safety rules and procedures. Safety performance is dependent on the level of management commitment to enforcing rules and procedures. Safety performance improvement will reach an upper limit with this type of culture – because no matter how committed management



▲ Stages of safety culture improvement

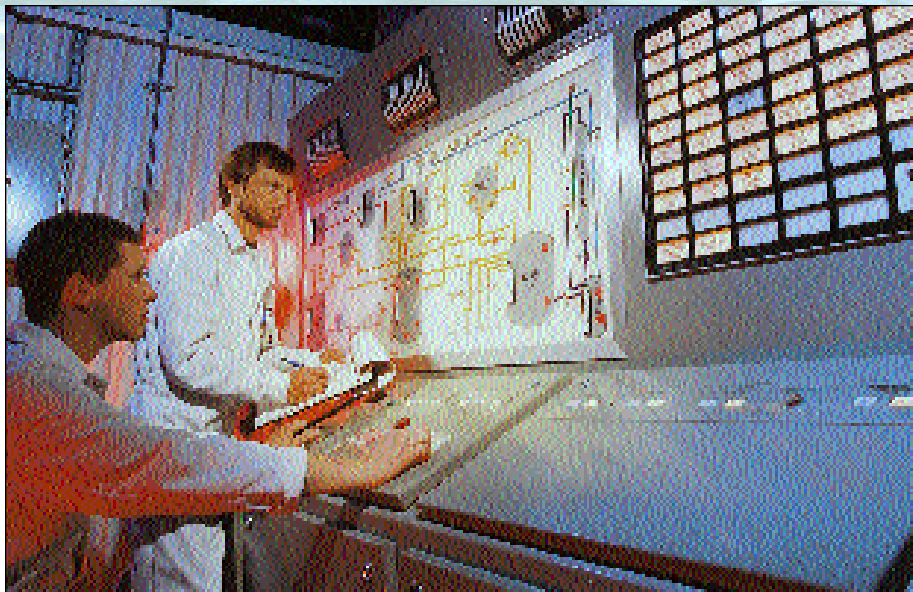
are, it is not possible to be everywhere and observe all operations.

If an organisation with a dependent culture wishes to progress, it needs to develop an independent culture. At this stage, the focus is on personal commitment to and responsibility for safety. This will involve all employees in developing their own personal safety standards and demonstrating their commitment by adhering to these standards. While there will still be safety rules and procedures, employees look after their own safety and make active choices to keep themselves safe. In an independent culture the focus on individual responsibility for safety may be indicated by statements such as 'everybody is their own safety officer'. Safety improvement will be limited by the extent to which there is homogeneity of the safety standards of individuals and the absence of people looking out for other people's safety.⁶

The final stage in this model of safety culture improvement is 'interdependent', where team commitment to safety is the dominant factor. This type of culture is manifested by workers having a sense of responsibility for safety beyond their own work and by caring for the safety of others. Employees share a common belief in the importance of safety. The movement toward an 'interdependent' culture is difficult, as it relies on more than personal commitment; it requires shared perceptions, attitudes and beliefs. In addition, employees must be willing to help others to adopt this belief system – not by sanction but by persuasion.

While this model describes the safety culture improvement process in three separate stages, it is likely that different





▲ Employee involvement at every stage can make all the difference to attitudes towards safety

parts of an organisation are at different levels at any one time. It will therefore be important for organisations to diagnose the stage that different parts of the organisation are at, before attempting to improve the safety culture.

There is no single best way to improve safety culture. The appropriateness of the method will depend on detailed consideration of current circumstances and goals. The two primary approaches are employee involvement, and developing supervisor's safety management skills to enable them to improve team safety attitudes and perceptions.

Enhancing employee involvement

Self-managing teams have an established track record of improving productivity, reducing costs, and raising employee involvement and satisfaction. Widely adopted in manufacturing, self-managing teams are now being implemented in safety-critical industries. Day-to-day control, responsibility, and decision-making is devolved to front-line employees, while supervisors become coaches.

To assess their impact on safety, Keil Centre recently completed a project for BP Oil's Grangemouth refinery and the HSE's Offshore Safety Division.⁷ By drawing on scientific literature and four in-depth case studies of onshore and offshore petrochemicals operations, a clearer picture of how self-managing teams can positively impact on productivity, job satisfaction and safety has emerged. The employee

involvement with all aspects of the business engendered by self-managing teamwork had an obvious impact on safety culture. Team members are now involved in a wide range of safety-related activities, with a knock-on link to safety attitudes and safety performance.

Many of the lessons learned about how to design and implement successful teams, and pitfalls to avoid, are currently being applied by BP's refinery, and are directly applicable to other organisations.

Developing supervisors' skills

The first line supervisor has long been recognised as the key individual in the management of safety. The supervisors' proximity to the worksite means that they are on the spot to know whether or not safety arrangements are working in practice. Recent research in the offshore oil industry investigated the impact of supervisors' attitudes, management style, and behaviour on their subordinates' safety behaviour. This study identified a number of supervisor attributes that were associated with positive subordinate safety behaviour and less risk-taking behaviour. Offshore workers who reported more positive safety behaviour and less risk-taking behaviour indicated that their supervisor possessed attitudes, skills and behaviours that can be summarised as:

- valuing their subordinates;
- visiting the work-site frequently;
- facilitation of work group

- participation in decision making;
- effective safety communication.

This research suggests that a supervisor safety management development programme could be an effective mechanism for safety culture improvement. The factors to be considered when developing a supervisor safety-development programme are:

- supervisor training should include a focus on the interpersonal aspects of safety management;
- training should be skill based (the how) as opposed to purely knowledge based (the what);
- subordinates should be involved in decision making;
- a role model should be provided to motivate supervisors and keep the process moving;
- support is given from senior and middle management. ■

Mark Fleming and Ronny Lardner can be contacted at The Keil Centre, Chartered Psychologists, 5 South Lauder Road, Edinburgh, EH9 2LJ Tel +44 131 667 8059 Fax +44 131 667 7946 Email: ronny@keilcentre.co.uk

References

1. CBI: *Developing a Safety Culture – Business for Safety*. London: Confederation of British Industry (1990)
2. ACSNI. Human Factors Study Group Third Report: *Organising for Safety*. London: HMSO (1993)
3. Mearns, K., Flin, R., Fleming, M. & Gordon, R. *Human and Organisational Factors in Offshore Safety*. HSE, OSD Suffolk: HSE Books (1997)
4. Reason, J. *Managing the risks of organisational accidents*. Aldershot: Ashgate (1997)
5. Lee, T. MacDonald, S.M. & Coote, J.A. *Perception of risk and attitudes to safety at a nuclear reprocessing plant*. Paper presented at the Society for Risk Assessment (Europe) 4th Conference: Rome (October, 1993)
6. Thompson, P. *Developing a safety culture in practice – interdependency and involvement*. Paper presented at the safety culture in the energy industries conference: Aberdeen, University of Aberdeen, 22–24 September (1997)
7. Lardner, R. *Safety implications of self-managed teams* HSE, OSD Report, Suffolk: HSE Books (in press)
8. Fleming, M. *Supervisors' management of safety in the offshore oil industry*, HSE, OSD Report, Suffolk: HSE Books (in press)