Safer behaviour at work

Industrial psychology contributors Ronny Lardner, Bob Miles and Mark Fleming talk about the psychological principles behind safety observation programmes which aim to modify behaviour

THERE ARE good reasons to target safe behaviour as part of an integrated approach to safety management. A significant percentage of accidents can be linked directly to unsafe behaviour which occurred near to the time of the accident. For example, a worker got a metal fragment lodged in his eye because he was not wearing the safety goggles supplied whilst grinding.

The upper part of the accident triangle in the diagram demonstrates that as the severity of the accidents and incidents decrease, their frequency increases.

The triangle can be extended downwards to include unsafe

▲ *Accident ratio triangle, extended to include unsafe behaviour*

behaviours – presenting opportunities to modify behaviour from unsafe to safe. Since the 1970s, a variety of behaviour modification techniques have been successfully applied to reduce unsafe behaviour – by doing this, it is possible to reduce injuries in the upper part of the accident triangle.

The origins of the behavioural approach

One of the earliest examples of the successful application of behaviour modification to improve safety took place in the 1970s in a US wholesale bakery. Following concerns over increasing plant injury, the departmental shift with the highest injury rate was selected for a behaviour modification project. Prior to the project, little or no reinforcement was provided by management or colleagues when people took time to act in a safe manner, and no opportunities were provided for employees to learn how to avoid unsafe practices.

Behavioural analysis of previous accidents led to a clearly-defined behavioural observation checklist describing safe and unsafe behaviours or, where possible, the outcome of the behaviour. Independent, trained observers measured baseline levels of safe behaviour. Following baseline measurement, groups of employees took part in a thirty-minute training session, where they were shown slides demonstrating safe/unsafe behaviour, focusing on behaviours with the lowest baseline level. Baseline performance was graphically displayed, and employees agreed to strive towards a 90% safe behaviour goal.

Over the following weeks, behavioural safety performance improved, consistently exceeding goals in one area. Supervisors also deliberately made favourable comments to employees who were behaving safely on key tasks.

Employee reactions to the project were favourable, although management and supervisory support was patchy. Employees subsequently took responsibility for observing and providing feedback. Over the first year of implementation, the injury frequency rate dropped from 53.8 to ten per million man hours worked.

Since then, many organisations have adopted variants of this approach, and specialist consultancies have sprung up to offer their own commercial behavioural safety products.

HSE research in progress

The UK offshore oil and gas industry has recently adopted a variety of behaviour modification techniques to help them achieve a step-change in safety performance. HSE's Offshore Safety Division and the cross-industry Step-Change in Safety initiative have funded a programme of work to:
● explain behaviour modification as applied to safety, and help the offshore industry and their workforce choose, implement or improve a behaviour modification approach suited to their circumstances;
● using a series of case studies, illustrate how and why a variety of offshore operators have relaunched, extended and improved existing programmes; and
● develop a safety culture maturity model to assist organisations in establishing their current level of safety culture maturity and enable them to identify the actions required to reach the next level of maturity.

Bob Miles, an HSE research manager, explains why the regulator decided to support this work. "It is becoming clear to us that behavioural modification programmes are gaining popularity in a number of the industry sectors in which we regulate safety. The emerging evidence demonstrates that – properly implemented – these programmes can be effective in reducing accidents and incidents. But we have also seen evidence of many poorly implemented programmes, or programmes which for other reasons did not achieve the promised improvements in safety performance. Only a minority of programmes worked first time.

"We see it as part of our remit to assist the industry in determining how to implement behavioural modification programmes successfully, and in so doing inform our own knowledge of these programmes. It is important that our inspectors are familiar with developments of this type and can judge the effectiveness of programmes they encounter in the field. We need to be able to give credit for successful programmes while at the same time recognising exaggerated claims which may be made for programmes which are not working. While behavioural modification is a powerful technique it cannot replace other components of a successful safety management system (SMS) – its role is to compliment the SMS and it should be integrated within it. When auditing an SMS our inspectors need to be informed of the interface and relationship between any behavioural modification programmes and the existing SMS.

"A final objective was to increase the general level of awareness and understanding of behavioural modification. Users were often unclear in their objectives or misunderstood the potential and the limitations of the approach. We hope that in sponsoring research in this area the HSE can increase the take up of this approach as another way of improving safety and also provide guidelines for a successful implementation."

This article draws on the work to date – the final report will be publicly available in early 2000

Attitudes or behaviour?

It is often assumed that the most productive place to start when changing behaviour is with attitudes. If only the 'right attitude' can be fostered, then the right behaviour is sure to follow. Unfortunately, the causal link between attitude and behaviour is weak. But the causal link the other way round, between behaviour and attitudes, is much stronger. If our behaviour changes and our attitudes don't, we feel uncomfortable, a state known as 'cognitive dissonance'. We tend to resolve this discomfort by changing our attitude to be consistent with the newly-adopted behaviour. For these reasons, proponents of behaviour modification recommend targeting behaviour change first, not attitudinal change. Indeed, there are examples of where an improvement in safety-related behaviours has been directly achieved, and this has been accompanied by improved attitudes to safety.

So what are the key principles and elements of a comprehensive behavioural safety programme? There are several well-established principles which underpin the modification of human behaviour.

● Behaviour can be measured – and to make measurement possible the behaviour you wish to change must be carefully-defined and observable.

● Behaviour is a function of its consequences – people will continue to behave as they do until either the consequences reinforce behaving in a different way or the consequences (or punishment) no longer reinforce behaving in the established way.
By carefully analysing events prior to a defined behaviour (the **A**ntecedents), the **B**ehaviour itself and the **C**onsequences, it is possible to gain insight into why people behave as they do. Using the results of this 'ABC' analysis, a plan is developed to change the antecedents and/or consequences, and thus increase desired behaviours and reduce problem behaviours.

● Behaviour can be changed by providing appropriate reinforcement and feedback – positive reinforcement, like thanks, praise, and support from colleagues and management, promotes behaviour change, whereas in an organisational context punishment, such as blame, criticism, or disciplinary action, is often counter-productive. Also, once behaviour has been measured, people need to see the results. Immediate, regular and specific feedback is more effective than feedback which is delayed, infrequent and vague.

● Goal-setting – when people are involved in setting challenging and achievable targets for changing their behaviour, this adds to the positive effects of reinforcement and feedback.

It is possible to define and measure many behaviours you may wish to change. By altering the consequences of a specific behaviour, providing positive reinforcement and immediate, regular and specific feedback, the behaviour occurs more often. If behavioural goals are also set, this adds to the positive effects of feedback and reinforcement.

When these principles are applied to improving behavioural aspects of safety, a programme with the features described in Table 1 may result.

Researchers have tried to establish which components of a behavioural safety programme are most important. For example, when the contribution of the training, feedback, reinforcement and goal-setting components were evaluated, the training-only component achieved mixed results. The addition of feedback, goal-setting and reinforcement through support from management and peers produced significant additional gains in behavioural safety performance.

There is strong evidence that behaviour modification techniques are effective in improving safety, and through modifying unsafe behaviour can reduce accidents and injuries. An important question is the degree to which success depends on how such programmes are implemented, and the degree of management commitment shown. Many of the successful safety improvements reported in the behaviour modification literature have occurred when programmes are implemented by academic researchers or specialist consultants. In such circumstances, control over how rigorously the programme is implemented does not rest wholly with company employees. This may limit the effectiveness of company-driven schemes, when implemented under sub-optimal conditions by personnel subject to many other organisational demands.

So what are the key aspects of

Table 1: Features of a comprehensive behavioural safety programme

Programme ownership	May be management-driven and implemented, or management-led with full employee involvement
Definition of safe/unsafe behaviours	Very specific definitions of safe and unsafe behaviours are made using analysis of accident records, analysis of critical incidents, expert judgements, observation and risk assessments. These behavioural definitions act as the lens which focuses subsequent observations. Not all programmes define safe and unsafe behaviours in detail
Establishing a baseline	To allow measurement of change, systematic observations are made of how frequently key behaviours are performed safely
Training	This may include principles of behaviour modification, examples of site-specific at-risk behaviours and development of observation and feedback skills to promote positive interactions about safety
Observation	All employees are encouraged to observe behaviours for evidence of safe and unsafe acts. Observation of unsafe conditions of work may also be included. A cadre of workforce representatives may be trained to conduct regular and systematic observations to establish the baseline and track improvements
Feedback	Feedback and reinforcement are the engine of a behaviour modification programme. Unfortunately this engine is not always firing on all cylinders. Ideally, feedback should be immediate, specific, and regular. This can be provided on a face-to-face basis and/or trends can be posted graphically in a prominent position
Reinforcement	The importance of positive reinforcement by managers, team leaders and colleagues cannot be overstated. Unfortunately, some behavioural safety programmes are allowed to become vehicles for blame, which seriously undermines their potential effectiveness
Goal-setting	Not surprisingly, there is considerable evidence that people are more committed to goals which are participatively set, as opposed to imposed by others. Face-to-face discussions about observations provide an opportunity for gaining commitment to individual behavioural change, and group feedback sessions on behavioural safety indices allow group goal-setting on targets for improvement
Review	To keep a behavioural safety programme fresh and forward looking, a regular programme review is recommended

programme choice and implementation that must be addressed to ensure success? Several issues must be considered before deciding to implement a behaviour modification programme. The questions in Table 2 may assist in establishing how appropriate this technique is for an organisation.

Effectiveness

Practitioners and researchers have also identified a number of factors that enhance the effectiveness of behaviour modification programmes.

The success of a behaviour modification programme can be influenced from the very beginning. Factors that enhance the likely success of the project include:

● joint management and workforce involvement in the process from the beginning, including the initial discussions about undertaking a behavioural modification project;
● selection or development of a programme that fits with an organisation's needs, culture and the existing safety management system;
● visits to other companies that have implemented a similar programme, by a sample of the workforce;
● selection of a steering group who will work effectively as a team;
● all levels of organisation being briefed about the aims and objectives of the programme and their role in the programme;
● front-line employees' participation in the process of setting programme goals and objectives;
● involvement of first line supervisors and middle managers in the process – and getting them to act as role models.

Programme maintenance should include:
● enduring management and expert support;
● management commitment to the programme to allow staff time to make observations;
● the use of all available means of communication to feed back results to the workforce.

Organisational structure should comprise:
● observers who are confident and have secure jobs and therefore can stand up to managers who may try to subvert the results;
● managers having consistent and high existing safety standards who are not sensitive to bad scores;
● the selection of behaviours that also have links to management production goals and ones that most employees would like to improve;
● an open learning culture – 'fair and just' – and deciding at the beginning of the programme how to deal with observations where people feel discipline is required.

Barriers and pitfalls

A range of barriers and pitfalls have been experienced when trying to implement behaviour modification programmes.

All behaviour modification programmes rely to a greater or lesser extent on workforce participation It is therefore critical that 'buy-in' to the process is obtained. There are a number of barriers which could prevent or limit workforce participation, including:
● concern about spying on their colleagues;

● perceiving it as another initiative that will never last;
● the programme being seen as a method for blaming workers for having accidents.

Behaviour modification programmes are less likely to be successful if the following management and organisational barriers are present. It is important to be aware of the potential impact of these barriers, in order to prevent the programme failing to achieve its potential:
● insufficient credible management support for the initiative, including neutral or half-hearted support;
● expectation of short-term gains that leads to a loss of commitment when improvement is slower than anticipated;
● lack of friendly communication between managers and workers prior to and during the programme;
● organisational change and downsizing, leading to low workforce morale and the loss of committee members and trained observers;
● a directive style of management which prevents the empowerment of staff;
● managers being inconsistent in enforcement of safety rules prior to and during the programme.

The success of the programme can be limited if the programme selected does not fit with the organisational culture or if it not implemented correctly. Frequently encountered barriers include:
● not involving supervisors in the process, leading some to abdicate responsibility for safety;
● programme sponsor not being available when required;
● the selection of an off-the-shelf programme or 'canned' approach that does not fit with the organisation's requirements or culture;
● inappropriate training material – such as using material developed for an American population;
● employees spread over a wide area working on their own, making observations difficult;
● the programme becoming a mode of communication for non-safety issues. ■

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Table 2: Readiness for behaviour-based safety

Are a significant proportion of accidents primarily caused by the behaviour of front-line employees?

Do the majority of managers and employees have a desire to reduce the current accident rate?

Are managers going to be comfortable with empowering employees and delegating some authority for safety to employees?

Are managers likely to be willing to trust results produced by the workforce?

Are the workforce willing to trust management?

Is there a high level of management involvement in safety, which is incorporated into management structure?

Does the organisation have the resources available to enable workers to take time to undertake the required training, carry out frequent observations and to make any improvements identified?

Who is going to be the champion of the programme for the organisation as a whole and at each site?

Are their adequate systems in place to deal with the amount of communication and feedback between management and workers?