Behavioural Safety - An Overview

ARTICLE No 12

Research shows that two thirds of accident victims considered their accidents to be avoidable - strongly suggesting that something could be done to reduce their incidence.

Accidents can be caused by any one (or combination) of the following behaviours. First, a lapse of attention. Second, a genuine mistake. This could be caused by a lack of knowledge and/or training or through misunderstanding a situation. Third, deliberately cutting corners in an effort to maximise productivity. Fourth, simple rule-breaking. Fifth, environment factors such as poor maintenance, housekeeping or the failure of systems and equipment.

It is important that we see these behaviours as symptoms rather than direct causes - and identify and address the root cause of these behaviours - or they will continue to occur. In other words 'prevention is better than cure' and merely reacting to the dangerous accidents does not facilitate the necessary long-term change to the system.

Ownership & Responsibility

It is a major premise that control of these behaviours is in the hands of both operatives and management . Management need to provide training, equipment - and consistently reinforce the most appropriate behaviours. Obviously, operatives need to act professionally and safely - but also they need to let Management know when operating procedures are not sufficient or they become outdated. Management need to respond positively to these communications so that the cycle of communication, co-operation and mutual respect flourish. This is the basis of the continuous improvement orientation that underpins the behavioural approach.

Accidents

The problem with accidents

Many safety campaigns focus explicitly on accident statistics. There are three main problems with using accident statistics. First, accidents are rare. Near misses are far more frequent but are seldom systematically reported and analysed. Second, accidents often involve a large element of bad luck, so that in the medium term a serious accident can be avoided through good fortune - giving a false sense of security. Third, once there has been an accident a number of parties have an obvious vested interest in denying responsibility. Objective investigations can prove difficult.

In contrast, behaviours - which are in the control of management and operatives - are far more plentiful and less emotive. For this reason some refer to behavioural approaches as 'working upstream of the accident'.

Unsafe Behaviour Doesn't Always Cause Accidents

In practise unsafe behaviour rarely results in an injury. In 1959 Heinrich found that 300 out of 330 unsafe acts do not result in an accident or injury. Of the 30 that do result in injuries, 29 cause only minor injuries, and only one causes a major injury. More recent research has consistently confirmed this basic finding - though actual ratios may differ. We look at it this way:

For every 330 unsafe acts there will be a serious injury. Therefore, every time we prevent 330 unsafe acts we prevent a serious injury.

The underlying principle is simple: identify the key behaviours that cause accidents - then reduce them.

Behavioural Research

Behavioural techniques have been shown to succeed in numerous industries including manufacturing and construction. These have been in countries such as Finland and Israel as well as the UK and USA. Areas covered included Manufacturing Operations, Housekeeping, Scaffolding, Access to Heights, PPE and the use of Plant and Machinery. Choker and Wallin (1984), Komaki et al (1978), Mattila and Hydodynmaa (1988). Commercial use of behavioural techniques was pioneered by Thomas Krause and John Hidley in the US in the 1980s.

UMIST performed HSE funded research on UK construction sites over a period of four years and showed that even with a work force made up largely of subcontractors the behavioural approach could show statistically significant results. On average during this study the incidence of unsafe behaviours was reduced by some 25% and aggregated all four research categories showed significant improvements. Marsh et al (1995), Duff et al (1993).

In the studies where it was appropriate to measure meaningfully, the number of accidents dropped accordingly. Therefore, it has been conclusively shown that behavioural techniques, if implemented correctly, reduce unsafe behaviour.

Other Types of Safety Campaign

To a certain extent, behavioural techniques have begun to prove popular because of the limited success of 'traditional' interventions. Some examples:

'Blitz' by UK HSE
Inspections of several thousand construction sites in the late 1980s were conducted by HSE in the Greater London area. During this period of the campaign the Health and Safety Executive found that there was no significant reduction in the number of deaths or serious injuries.

Awareness
Attempts to improve safety standards through methods such as poster campaigns have rarely proved successful - as illustrated by a study in a Finnish shipbuilding yard in which a two year campaign did not reduce the accident/injury rate. Further evidence of the ineffectiveness of safety awareness campaigns is indicated by the UK construction industry 1983 accident statistics. During this year the 'Site Safe, 83' national safety awareness programme was run - but there was an increase in the accident rate over the previous 5 years. (It is possible, of course that this result reflects - to some extent -an increase in reporting due to increased awareness).

The Problem with Punishment

At the individual level when non-compliance with legislation or safety rules occurs, management traditionally use discipline and punishment in an attempt to rectify the situation. In contrast management rarely congratulate for correct behaviour. This is unfortunate as research shows clearly that positive reinforcers are much more powerful than negative ones. For example, we are all used to the idea of deferred reward and can be motivated strongly by a simple 'well done' from a senior colleague who may soon perform our appraisal/ choose who to promote. Research shows that punishment, on the other hand, needs to be both inevitable and delivered soon after the behaviour to be highly effective. Of course this is not feasible. You cannot punish someone immediately and every time they commit an unsafe act - simply because you are not always going to be there to observe it. A mild but persistent punishment such as frequently being rebuked simply becomes an irritation.

Attitudes and Behaviour

It is assumed that if you can change someone's attitude -then a change to their behaviour will follow. Awareness campaigns are obviously based on this premise. Unfortunately research shows clearly that changing a person's attitude is not at all easy to do - and that even if you are successful their behaviour may change very little if environmental factors remain the same.

Numerous studies have shown that in many if not most circumstances the influences of a certain social situation will over ride a person's attitude. The stronger the situational pressures - the less likely individual attitude will predict behaviour.

Research in the field of Social Information Processing theory also helps explain problems with changing attitudes. This work shows that we: often do not notice messages: do not always understand them if we do notice them: may distort, deny or rationalise the message if we do notice and understand it. Even if all this is avoided and attitude change is achieved - this may not lead to a change of behaviour if environmental pressures are too strong. For example, if you now do not want to work with a material because you have learned that it may well be harmful in the long term but suitable PPE is not available and you will not be paid if the work is not completed. Frequently, the operative in this situation will be worried but will work as quickly as possible without the PPE.

Another major problem is that measuring attitudes is difficult. The old management maxim 'if you can't measure it you can't manage it' applies. Importantly, even when you do not measure attitudes if a measure can't be validated it is impossible to know if its accurate or not. How do you validate a measure of attitude? By researching how well it predicts a key criterion - such as behaviour.

Attitude Change and Behaviour

Given these problems it would be tempting to say that if the correct behaviour is achieved - why bother about the attitude? In the long term, however, attitude change is important if safe working practises are to be internalised by operatives. Importantly - and following on from this - evidence shows that changing behaviour often leads to an automatic change in attitude. This is because people don't like their behaviour and attitudes to contradict each other. (A phenomenon known as 'cognitive dissonance'). Basically, if there is a mismatch between the way we behave and our attitudes, internal tensions result - and the easiest way to remove these unpleasant tensions is to change our attitudes. A simple example will illustrate. Despite huge efforts to persuade us to 'clunk - click every trip' accompanied by graphic fear messages, seat belt use failed to increase to satisfactory levels. New laws enforced strictly meant that we had to wear them - and now few drivers would feel comfortable driving around without a seat belt.

Social Norms

There are many definitions of safety 'culture' but perhaps the most simplistic and useful is the definition that the culture is what is 'normal' in a given organisation, site or shift. 'Normal' is this case of signifying 'usual behaviour'. Individuals will usually tend to fit in with these norms automatically - regardless of any other factors. In short, individuals are influenced by the existing 'safety culture'. As one of our interviewees put it "when you first get to a new site you look about to see what's what". There are many numerous anecdotal examples.

A factor of great importance is that if the culture of the organisation can be fundamentally changed - just as it was difficult to change in the first place - so it can be difficult to change back. It was through impacting on the culture of the building sites UMIST were studying (in the HSE research) that allowed them to show continuous long term improvements in safety performance despite the huge turnover of sub-contract staff.

Goal-Setting and Feedback

Lord Cullen's report into the Pipa Alpha tragedy suggested a move from an inspection of sites to an auditing of systems approach. He emphasised that organisations should encourage safety proactively rather than reacting to accidents. In doing so he specifically endorsed the use of goal-setting. Behaviourists frequently use goal-setting and feedback as part of their intervention.

Feedback is essential for learning as it is for error correcting. In addition, knowledge that performance is improving towards valued goals is high motivating. Typically, we use a number of graphical feedback charts throughout the site that give scores of groups of operatives. We use group scores as much as possible to emphasise a collective approach to safety.

We have found that it is unusual for operatives to gather round the charts as they are being updated each week. No matter how little interest an operative has in the scores, however, the charts are a daily reminder that unsafe behaviours are the cause of accidents and are being scored - and that management have a commitment to a continuous improvement safety programme. As such it is useful to use as many charts as are required to ensure all operatives see one on a daily basis.

Performance is reported back to the workforce on a weekly basis and once 85% goal is reached higher goals will be set - so that a process of continuous improvement is undertaken. For goal-setting to be most effective the following guidelines should be adhered to. First, the goal is specific and understandable. 'All operatives to wear their safety helmet at all times in all areas' is a clear goal. 'Be safe!' (the typical poster encouragement) is too vague. Second, the goal should be difficult enough to be challenging - whilst remaining realistic. An unrealistically difficult goal may actually reduce motivation. Usually, the typical performance of the top third of operatives is a good benchmark. Third, the goal should be seen as valid and desirable by those striving for it. Obviously, this may require operatives training in the risk faced. Once all agree that an increase in safety behaviour is desirable, the validity of the goal will be maximised by setting the goal in a participative fashion - i.e. consulting the work force as to what they think is a realistic improvement over a period of four to six weeks, for example.

If this process is running properly operatives will be empowered to identify obstacles to the goals - and to suggest practical ways around these obstacles (for example, more user-friendly PPE, training in the correct use of equipment or perhaps a change to a management system that itself hinders safe behaviour).

Naturally, management need to act on these suggestions if at all practical - and this process of communication and co-operation is at the core of a continuous improvement approach. In essence, the qualitative aspect of the intervention is successful if enough practical suggestions are acted upon for those making the suggestions and those collecting them to feel that it is worthwhile to continuing do so.

Management Commitment & Conflicting Rewards

We are often asked 'this sounds good in theory - does it work in practise?' The truthful answer is not always. If it does not, however, there is nearly always one simple factor causing the failure - the behaviour and attitude of management.

Thorndike's famous law of effect says "behaviour that is rewarded increases". It is a simple rule of thumb worth keeping in mind when considering management actions. Many organisations claim that they do fully reward safe behaviour - but it is often the case that their actual systems and procedures do not support safe culture to an ideal extent. An example is a lack of formal safety training for line management. We have found that management will be reluctant to enforce safety regulations rigorously if they are uncertain what they are.

Management Commitment

A huge volume of research points to one vital fact - Management Commitment is vital to the success of any organisational intervention. Detailed statistical analysis of UMIST's research findings showed, for example, that whilst management commitment, observer performance and quality goal-setting and review sessions all correlated significantly with the success of the intervention, it was management commitment that was the underlying cause of all of these. For example, high levels of management commitment almost always ensured a suitable level of observer commitment.

Management Style

It can be argued that managers fall into one of two distinct types. The first type of manager, the 'fire fighter', will not tolerate safety standards falling below a certain (often very high) level. This manager will react strongly when standards fall too far but will pay little direct attention to safety if standards are adequate. The second type of manager, however, strives for continuous improvement and their attitude is congruous with Total Quality Management (TQM) systems. It is the later type of manager who will pay most attention to the increased information generated by the goal-setting and review sessions and the increased awareness of safety issues. It is these managers who will achieve continuous improvement through systematic measurement and feedback.

Summary

In summary, the research discussed above clearly explains why traditional approaches to improving safety have so often proved ineffective. (At a behavioural safety conference in May 1997 an 'experienced' safety practitioner joked. 'It's not fair you have all these fancy techniques and all this research to work with...we knew a lot of what we did was ineffective, we just didn't know why - or what we could do about it!').

Discipline is frequently ineffective and concentrating on changing attitudes as the way to improve safety has two main obstacles. First, attitudes are difficult to change and difficult to measure. Second, even if they can be changed there is often a tenuous link between attitudes and behaviour.

The behavioural approach has two fundamental principles that distinguish it from traditional approaches. First, it focuses directly on behaviour rather than on attitudes. Second, it stresses encouragement rather than punishment. These principles help circumvent the problems faced by 'traditional' approaches. In addition, the 'TALK' approaches stress objective analysis, understanding and frequent and accurate 'bottom up' communicatio