

Behavioural safety

A new workplace hazard to risk assess

A guide for UNISON safety reps

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Introduction

Behavioural safety (bhav) programmes aim to improve safety by changing the behaviour of workers. They may also be called 'behavioural modification' or 'behaviour based safety'.

Most bhav systems tend to believe that injuries (and possibly illnesses – see later) are the result of 'unsafe acts' by workers, and to prevent these unsafe acts management should aim to change unsafe behaviour. Records and reports may be submitted to a committee which may include union or management-appointed worker reps. The committee will analyse the information, look for trends, and make recommendations on how to tackle workers' behaviour.

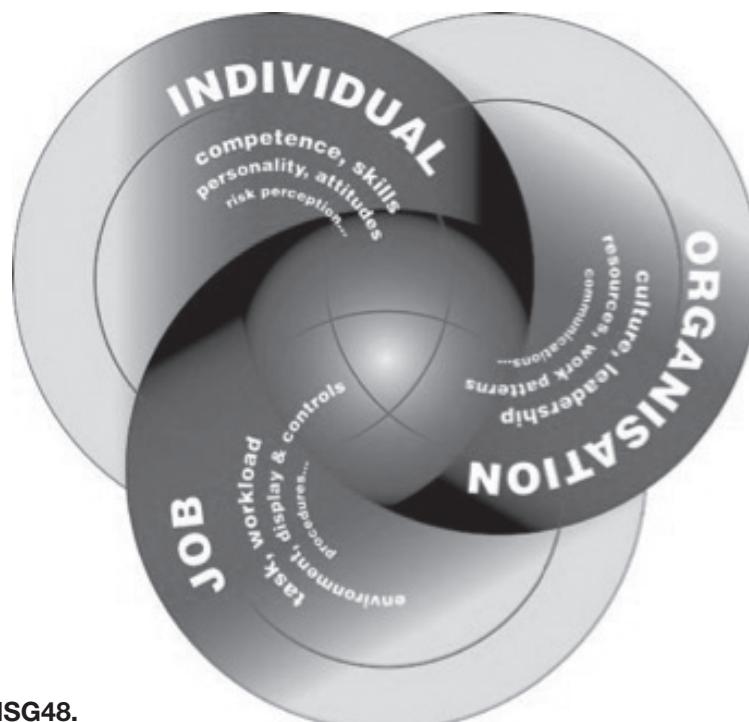
Individual workers are observed and given feedback. 'Safe behaviour' such as an 'accident free' period is praised and even rewarded. 'Unsafe behaviour' such as incidents or injuries may see workers blamed or even disciplined, and will be discussed until the worker 'learns the lesson' and agrees to change their behaviour. The assumption is usually that any incident is due to worker error. Reaching this agreement is not necessarily friendly, and can include an implied threat of losing your job if you fail

to agree. Red, amber, and green cards may be given out – not dissimilar to the warning cards in football.

There have been positive reports for some bhav programmes, but these are likely to have been part of a wider system which was managing health and safety in all the usual ways, such as assessing risks, managers taking responsibility and valuing health and safety, and good joint working between the employer and unions.

By comparison, the Health and Safety Executive's (HSE's) guide Reducing Error and Influencing Behaviour (HSG48) looks at what it calls human factors and their role in a rounded health and safety management system. The message is that "proper consideration of 'human factors' is a key ingredient of effective health and safety management."

"The HSE definition of: "Human factors [is that they] refer to environmental, organisational and job factors, and human and individual characteristics which influence behaviour at work in a way which can affect health and safety. A simple way to view human factors is to think about three aspects: the job, the individual and the organisation and how they impact on people's health and safety-related behaviour."



Human Factors – HSG48.

So considering human factors means that the job and “tasks should be designed [ergonomically]... to take into account limitations and strengths of human performance.” People have different skills, habits, and attitudes, and these can be changed or enhanced through training for example.

There will also be consideration of whether individuals:

- of all size can see and use the controls
- are stimulated by the job and therefore likely to be able to keep paying attention
- are not sleep deprived by the work
- are involved and given training
- can see senior management commitment to health and safety and leading by example on it.

However, the guide makes it clear that “organisational factors have the greatest influence on individual and group behaviour, yet they are often overlooked during the design of work and during investigation of accidents and incidents. Organisations need to establish their own positive health and safety culture... [and this] need[s] to promote employee involvement and commitment at all levels.”

So human factors must be considered:

- when risk assessing
- when investigating and analysing incidents, accidents, and near-misses
- in design and procurement
- in all other aspects of health and safety management.

The HSE also explains that safety culture goes further than bhav, by also covering the behaviour, decisions, and actions of management. Such as, will they stop production for safety reasons regardless of cost, and do they not allow or make sure that short cuts are avoided by ensuring that they are not necessary. A safety culture also actively encourages worker involvement (beyond the legal minimum) and enables anyone to raise concerns.

Most bhav systems see changing worker behaviour as the main or only focus. This is the kind of programme UNISON is campaigning against as wrong and too simplistic. As the HSE makes clear, when you consider behaviour it must not be in isolation, and must not be just of the frontline worker.

What is UNISON’s concern with bhav programmes?

While we must all take care and be responsible, too often bhav programmes look no further than blaming the worker for an incident – perhaps looking at only the last step which led to it. But most incidents are caused by a combination of factors, with the main cause usually the poor management of health and safety.

If a worker slips over, an employer may argue that they were rushing about and not looking where they were going despite being warned about the dangerous floor. However, safety footwear may have reduced the risk of a slip, and a clean floor may have removed the slip hazard altogether. Time pressure to get the job done “on time” may also have been an important factor.

Bhav programmes are liked by employers because they focus on the behaviour of the workers and not the employers and managers. This is despite the fact that it is the employers and managers who have the power to make the decisions, and thereby prevent or minimise risk and improve health and safety.

In the US, the problem has gone further with bhav programmes used to undermine the trade union structure.

Ten things wrong with bhav programmes

1) Bhav does not remove the hazard and ignores inherent risks

The key focus of bhav programmes is usually that a worker causes injury by their unsafe behaviour, so they should change that behaviour. In reality, there has to be a hazard before an 'unsafe behaviour' can cause an injury. So the first priority is to remove the hazard - this is the approach under the recognised method of risk assessment.

So if Daisy trips over a box, rather than just expecting her and everyone else to look out for boxes placed around the floor, the employer should remove the boxes from all pathways.

2) Bhav doesn't look for the root cause; usually observing only the last of many steps

After an incident, it is all too easy to find the last in a long line of issues to be the one to blame. This is what bhav usually does, but a good health and safety system will try to get to the root (initial or primary) cause. To do this, you have to keep asking why.

So if Ray got something in his eye at work:

Ask why? Because he wasn't wearing his safety glasses.

Ask why? Because they were very scratched so he could not see clearly through them.

Ask why? Because to save money his employer bought the very cheap glasses that easily scratched and had not replaced them for a long time.

So the root cause was the buying and lack of replacement of poor quality safety glasses. If better quality safety glasses had been provided and replaced when necessary, Ray would have been able to wear them and would not have got injured.

Once the root cause is identified, it should then be removed, at which point all the other steps leading to the incident will no-longer occur or present a risk.

3) Bhav misses what actually happens in the workplace

Bhav systems are generally based on observation, but people act differently when observed, and not all unsafe behaviour is easy to observe by watching a task. For example, a failure to properly implement a permit to work system. Some dangerous events are very rare so may go unobserved, such as a machinery break down or a triggered alarm, despite possibly serious or catastrophic consequences. This may include for example gas and chemical leaks, with all the attention given to more frequent and easily observable but usually less serious hazards.

4) Bhav does not adequately deal with the possibility of human error

All humans may become distracted, bored, or tired; may take chances, misunderstand, or make mistakes. These are completely human characteristics. So the equipment, systems, and procedures that we use and the tasks and jobs that we do must take these into account. That is, they should be error-tolerant. Otherwise if something can go wrong, it will be just a matter of time before it does, and if this isn't catered for, then this is error-inviting.

Where a worker fails to follow proper procedures, this is usually because either: they had not been trained so were not clear on them; they simply did not suit the actual working conditions so could not be used (such as procedures that do not take into account environmental factors such as outdoor conditions or cramped spaces); or supervisors or managers were turning a blind eye to the infringements to keeping the job going. Training and procedures will also have limited effect on unintentional behaviour such as where a worker mistakenly connects a hose to the wrong valve.

So an overworked and tired worker might not lead to an injury unless a few other factors encourage the error, such as:

- a machine that continues to work when a safety guard is removed (when an interlock would prevent its use),
- being able to wrongly connect a piece of equipment with catastrophic consequences (when good design would make only the right connection possible by for example having different sized or type of fittings), or
- the chance of two substances being confused for one another (which could be minimised by storing them in different places and/or containers, possibly giving them different names, and/or having robust signing in/out procedures so that there is another individual checking for their correct use).

The TUC's guide (see appendix 7) sums it up like this: "You prevent someone who is operating a guillotine from cutting off their hands by ensuring the machine is properly guarded and that the blade cannot operate if there is any inappropriate obstruction, not by teaching the operator to keep their hands out of the way." The HSE guide, HSG48 takes the same approach. Jobs, processes and procedures need to be designed to fit humans and take account of human factors. For example, the fact that people are naturally more likely to be sleepy and as a result, to make mistakes between 2am - 5am should not be ignored. Instead, this should be risk assessed with appropriate measures of prevention and control put in place.

If there is a risk of an electric shock, it is better to only provide non-conductive step-ladders, rather than training electricians when not to use metal ones. Otherwise one day someone will make that mistake. Trains have automated braking for when they pass a red light, and cars are made as safe as possible for occupants and pedestrians, because drivers will make mistakes.

5) Bhav usually fails to observe the behaviour, decisions, and influence of management

Bhav programmes tend to focus on frontline workers and so do not prevent incidents in which their behaviour is not involved.

By not considering the actions of the boardroom, managers, and supervisors; bhav ignores decisions that have a significant impact on resource priorities, work speeds, shift patterns, staffing levels, and the purchasing (or not) of new and possibly safer equipment.

These latent (hidden until they occur) failures made by people at a time and place away from the frontline worker provide a greater danger to health and safety. This is because they remain unnoticed until they cause an event so serious that they cannot be ignored.

Recent research (Collins and Keeley - 2003) found that although the immediate cause of major incidents frequently involved 'human error' by frontline workers, the reasons that these errors were able to occur in the first place was usually due to a failure of safety management and were the responsibility of those more senior in the organisation. The HSE estimates that 70% of deaths and injuries are down to management failings.

6) Bhav tends to blame the worker

With bhav's focus on the actions of workers, they normally blame the worker. However, the worker is not only usually the victim of the incident, and one of the more vulnerable (as compared to more senior persons), but (as already explained) may be just the last link in a chain of events. A lot of schemes first advise on 'corrective action', but if more injuries occur, the worker may be labelled unsafe and face disciplinary action. Disciplinary action can become managements' favourite tool in response to a health and safety incident. It means that they don't get blamed and don't have to do anything themselves (such as correcting their own bad decisions, or inactions).

Bhav does not consider whether another individual would likely be injured if they were to do the same task, but if this is possible then the problem is not an individual's behaviour. Focusing on individuals can also mean that the act of pure chance can be mistaken as something significant.

For example, with a large group of workers over a specific time, you might expect on average for 1,000 of them to suffer a minor injury. Statistically, a small number (maybe 16) might each be involved in a further incident, and one may be involved in three. This is known as the "Poisson Distribution." This can be perfectly normal, since an average is just that. There will always be some who are above or below average just by chance. However with bhav, the employer can end up paying more attention to the 16 "accident prone" workers and disciplining or sacking the "very unsafe" worker with three incidents. Of course if the only factor is chance, then the worker injured three times is very unlikely to be injured the following year.

With bhav often linked to "accident repeater" programmes, the vast number of incidents (one each for 983 workers in the above example) are likely to be ignored. However, a risk assessment and hazard mapping exercise which better analyse the data might identify a common cause, or a significant risk just waiting to happen. For example, if these incidents are repeated slips on stairs, it may only be a matter of time before someone gets seriously injured. But as they are occurring to different individuals, the "accident repeater" programme won't necessarily identify the risk as they usually just look for the individual "repeaters" rather than the specifics of the incidents.

7) Bhav usually ignores ill health

Most bhav systems also concentrate on safety and ignore or don't fully consider occupational ill health. Injury statistics are easy to measure and so targets are easy to set. Occupational diseases can take years to develop and are rarely recorded, so bhav's format of observing "unsafe acts" and consequences does not work so well. And since it is not possible

to show "quick wins" for work related diseases, those who sell bhav and employers who use them, may happily ignore occupation ill health whilst marvelling at their "success" with safety incidents.

But this is a big mistake. Using the government's own figures, the TUC says that around 20,000 die each year from work causes - almost 19,000 of these due to ill health. The National Hazards Campaign believes that the government's figures are a huge underestimate, arguing that up to 50,000 die each year, almost 49,000 of these from work related ill health.

8) Bhav doesn't necessarily improve injury rates

Worse still, any "success" in reducing accident rates may be an illusion or at best short lived.

Where bhav seems to have reduced injury rates this is often due to a huge amount of effort and resources being put in place by the employer. This is money which could be better spent on developing a more rounded health and safety management system. It may also reflect the positive effect of it possibly being the first time health and safety was actually considered. So once the project is no longer new, or committed resources reduce, any improvement is unlikely to continue.

More worryingly, some reductions are likely because of less reporting, not less injury. Workers are less likely to report an injury or incident if they fear an interrogation, being blamed, or being punished for their alleged mistakes. Bhav systems also often have schemes which reward: no reports, no lost time, or no claims being made. So a worker is encouraged not to make a report for fear of losing their own or even their works-team bonus, prize, or competition entry. But these failures to report can result in ill or injured workers feeling forced to return to work before they are fully recovered. They also do not prevent the harm occurring again probably to someone else, but in future the consequence could be far worse.

By comparison, rewarding positive action rarely occurs, but could be far more effective. For

example, rewards for ensuring that plant is locked off before being entered, for replacing a guard on a machine after maintenance, or for refusing unsafe work until it is made safe. In fact, refusing hazardous or unsafe work, the most important safe worker behaviour of all, is usually not encouraged, not recognised as an option, or is even actively discouraged.

Of four detailed bhav case studies examined in a HSE research project, only one demonstrated a significant reduction in accident rates (see appendix 7 - further resources below). An HSE-backed evaluation of a safety project in the print industry between 1998 and 2001 found that it had cut deaths and serious injuries by over 25% and led to a marked improvement in health and safety. However, whilst an overall success, the bhav initiatives within the project were found to have been a near total flop that were ditched by most of the employers using them. See the "PABIAC initiative" in appendix 7.

9) Bhav doesn't necessarily comply with UK law

The Management of Health and Safety at Work Regulations require hazards to be identified by a risk assessment process. This should result in the hazard being removed or any risk being prevented or reduced so far as is reasonably practicable. There is also a preference for using collective protective methods (which protect a group or population) over approaches that protect just individuals. This is done using the 'hierarchy of control', and the 'general principles of prevention'. The idea behind these is to combat the risk at source, tackle the root cause, and offer protection to the greatest number.

So first it is expected that the hazards will be removed and therefore all associated risks avoided. If this is not possible then a safe or safer alternative should be used. Next, physical controls should be used to prevent or reduce any remaining risks. If some risks still remain, procedures are then put in place to minimise exposure to these. Only after all of these steps have been taken should personal protective equipment (PPE) be used. See appendix 6 for

more on the hierarchy of control and principles of prevention.

Bhav's focus on fixing the unsafe actions of workers (such as a failure to follow information, instructions, or to use PPE) can lead employers to divert their attention, or limited budgets or resources away from the risk assessment approach. This can leave hazards in place and result in a failure to manage the risks, as with the example of BP (see appendix 2).

10) Bhav may undermine the collective support given by trade unions

Bhav programmes may undermine trade union activity on health and safety by decreasing or undermining the role of joint health and safety committees and safety reps, and by pitting worker against worker. Bhav can encourage workers to blame one another for incidents and for the loss of rewards or bonuses. In the US, bhav was actually introduced as part of union busting packages. However, the proven track record of the union effect is that organised unions with active safety reps improve workplace health and safety using the familiar hazard risk assessment approach. See the TUC's report on The Union Effect for more detail (see appendix 7).

How to challenge the introduction of bhav programmes

Given the concerns with bhav, UNISON advises branches and safety activists to oppose their introduction. The following questions and points for consideration may convince your employer that bhav is not the best method for managing health and safety, and will help to inform members and other workers. Even where the employer still insists on using bhav, they may help to ensure that the management of health and safety and the implementation of bhav will be better than it otherwise would be.

- 1) Insist on proper consultation from the very beginning. Even if the bhav project has a working group or steering committee with union reps, any proposals need to be fully consulted on with the union safety reps and the joint health and safety committee. The role of the safety committee is not replaced.
- 2) Don't allow members and workers to be misled by meaningless consultation. Once the employer has chosen to implement bhav, allowing workers to identify the unsafe behaviour is meaningless. Instead consultations need to start at the very beginning with the question of what method will the employer use to manage health and safety. This should follow a risk assessment based strategy.
- 3) Hold workplace meetings to inform members and workers of the dangers and pitfalls of bhav – use this guide.
- 4) Counter proposals to invite workers to “sign-up” to bhav by suggesting that they be invited to discuss workplace hazards, attend safety inspections, and take part in a hazard spotting rewards system.
- 5) Remember the modern and accepted approach to health and safety sees workers as part of the solution and asks them why the job is dangerous or why the safety measures don't work in practice. When workers are ignored, valuable information is lost, and things go wrong.
- 6) Whatever system your employer proposes to use, they must still seek to remove or reduce hazards and minimise risks as far as is reasonable through risk assessment. Other safety programmes are secondary to this.
- 7) Ask how the employer expects bhav to improve health and safety? What evidence is there that bhav is necessary? Has everything else been done to remove the hazards or control the risks?
- 8) Ask for a list of all the incidents over the previous two years that occurred primarily as the result of a workers' 'unsafe act' or behaviour. Ask for all the details including the accident and investigation reports.
- 9) Ask for a list of all the incidents over the previous two years which occurred primarily as the result of an unsafe or unhealthy job or workplace. Ask for all the details including the accident and investigation reports.
- 10) Ask how the bhav programme will operate.
- 11) Will ill health effects will be considered, and how?
- 12) Are there any disciplinary features, incentives, or rewards, and how will they operate? Punishing 'unsafe acts' or reports will encourage under-reporting, as will incentives which recognise a lack of reports or incidents. So negotiate for rewards to be given for positive action, such as making work safe by identifying serious hazards, recommending effective measures of prevention or control, replacing guards, locking off plant, and especially for refusing unsafe work until it is made safe.
- 13) Does the plan involve observing only workers or will managers, owners, directors, the CEO or the Board's activities and decisions, etc. also be observed?
- 14) Do any examples of safe and unsafe behaviour cover managers' specific work and performance indicators (see the HSE Climate Tool Survey – further details in appendix 7)
- 15) Will the chain of events/root causes be investigated? Ask for an example of how this will operate.
- 16) Will all the human factors that influence behaviour (as identified by the HSE in HSG48) be considered? See appendix 7, but these include: provision of necessary skills and

training, workload, error-proof or error-prone controls, resources, work patterns, and leadership.

- 17) Don't trust consultants or "experts" that have a bhav package to sell. They are not objective.

Appendix 1

The background on bhav

Bhav has been around since the 1930's and follows the ideas of an insurance executive called Herbert Heinrich. Heinrich reviewed thousands of accident reports in insurance claim forms. Completed by supervisors, 73% of these reports classified the accidents as "man-failures", onto which Heinrich reclassified a further 15%. So he claimed that 88% of all accidents, injuries, and illnesses were caused by worker error.

There are serious concerns about the data Heinrich used. The supervisors opinions on the cause were never questioned by Heinrich unless it was to reclassify it as a "man-failure". The records only allowed for or included one reason, were badly completed, and no consideration was given as to why any of the workers might have acted in the way that led to the incident.

In effect, the statistics used by Heinrich were a product of their time and circumstance. Some of the views expressed around bhav at this time were highly insulting about the perceived lack of intelligence of the average worker. Moreover, since it was the supervisor who was responsible for supervising, and owed their job to their employer; how many would fill in a claim form and blame themselves or their employer?

In trying to justify bhav programmes today, it is often claimed that between 70 - 90% of incidents (or even more, it varies) are caused by 'human error'. However, suppliers of bhav, employers, and managers usually only see human error as referring to front line workers only.

In HSG48, the HSE makes it clear that if human error is to be properly considered, all individuals within the organisation including managers must be considered. As must the reasons why these errors occurred and how they may be prevented.

Appendix 2

The bhav suppliers and supporters of today

Bhav programmes tend to be developed by management consultants who of course want to sell their products. Supporters argue that with huge improvements having been made in technical and engineering controls, and in managing health and safety; now a new approach is needed if further gains are to be made.

This claim, effectively that the risk assessment process has done as much as it can, so bhav must now be pursued is wrong. Major accidents still occur and re-occur due to poor health and safety management or failed engineering and technical controls, as the case studies below demonstrate.

Case study – BP

BP is a major supporter of bhav. The Texas City refinery explosion in 2005 killed 15 people. BP's internal investigation blamed 'human error' - the "surprising and deeply disturbing" actions of a number of workers and managers who it sacked as a result.

However, a 2007 report by the US Chemical Safety Board stated that there were numerous causes. These included: cost-cutting at the top of the company that affected safety conditions, outdated equipment, malfunctioning valves and indicators, worker fatigue, poor training, locating trailers too close to hazardous areas, and ignoring numerous warnings and "near misses." However, management failings and BP's focus on the behaviour of their workforce meant they had neglected process safety.

BP (and two other companies) was also found to be responsible for the Deepwater Horizon oil spill in the Gulf of Mexico in 2010. That's just five years after the Texas City explosion.

Case study – DuPont

DuPont is a major international company with various interests, including selling its "STOP" bhav system. This system is probably the most widely used bhav programme in the world, but is dubbed by unions at DuPont as the "blame-the-worker" system. However, it has not stopped serious and fatal accidents at DuPont, including the death of Carl Fish. He was sprayed with a dangerous chemical from unsuitable broken old pipes whilst working for DuPont.

An investigation in 2011 by the US Chemical Safety Board found documents which showed that DuPont had considered making improvements to remove this risk in the 1980's. However the company decided that the relative benefits (of potentially saving lives) was outweighed by the definite saving from not spending on the improvements.

Following four deaths in 2014 at a DuPont chemical plant in La Porte, Texas, the US government safety regulator, OSHA, cited the firm for 11 violations, three wilful, one repeat, and four serious. And it placed the company in its close scrutiny, severe violator enforcement programme. OSHA head, David Michaels stated that "DuPont promotes itself as having a 'world-class safety' culture and even markets its safety expertise to other employers, but these four preventable workplace deaths and the very serious hazards we uncovered... are evidence of a failed safety programme." TUC head of safety Hugh Robertson commented: "So much for a company that has the brass-neck to tell other companies how to develop a safety culture." He added: "Of course in the UK, behavioural safety has less of a hold, but it is growing... It has certainly been seen... in the North Sea, where the Health and Safety Executive... has been forced to insist that some operators change their processes based on behavioural safety and instead adopt a proper risk assessment approach."

Appendix 3

Why might workers initially welcome bhav?

At first some workers may welcome the introduction of bhav as good news. They will be observed by other workers, someone who knows the job, and who is promised extensive training. For once it may seem that health and safety is being taken seriously by management.

It may also be the first time workers have been asked for their opinions by management. They may be asked to draw up a list of critical, safe, unsafe, and model worker behaviours. It may all seem to make sense, without the 'complicated language' of risk assessment. On top of all this, there may be rewards for safe behaviour. By these ways workers support or "buy-in" may be achieved and bhav can be claimed to be "worker-" and "floor-led."

However, by framing the questions in the right way, the employer can ensure that any discussion leads to the answers they want and the worker is steered away from considering the possible root causes such as: why are they rushing, not doing the job properly, or carrying too much.

For example:

Employer:

Do you believe that workers behaving in an unsafe way are a risk?

Worker:

Yes.

Employer:

Should we therefore encourage workers to behave safely?

Worker:

Yes.

Employer (may be):

And discourage workers from behaving unsafely?

Worker (at first hesitant):

Okay, yes (but "hey I'm safe")

Employer:

So what unsafe worker behaviours should we discourage?

Worker:

Not doing the job properly, rushing, carrying too much, etc, etc.

The employer may use a similar tactic with safety reps and joint health and safety committees. It may ask them to consider how a bhav programme might operate to make it appear as if there was genuine involvement and consultation. However, real involvement and consultation would start with a discussion about whether bhav should be adopted in the first place or how health and safety should be managed.

A better conversation will go something like this:

Employer:

We need to improve how we manage health and safety.

Safety rep:

I agree.

Employer:

We must consider all relevant factors and methods.

Safety rep:

So we'll assess the risks from hazards?

Employer (may be):

And then look at our current measures of prevention and control, evaluate whether they are working, and consider if new or different measures are required.

Safety rep:

So where possible you'll get rid of the hazard, and where not remove or minimise the risk from it.

Employer:

That's right, we need to consider the principles of prevention and the hierarchy of control.

Safety rep:

Even where someone has made a mistake?

Employer:

Absolutely! Why was their mistake possible to make, why did it have the outcome that it did, and what could prevent either of these in future.

Appendix 4

So should we ignore trying to change behaviour?

Encouraging safe ways of working is important in reducing injuries and illnesses. Training and information for workers are therefore a key part of any attempt, are strongly supported by trade unions, and are required by the law. It is reasonable to expect people to pay attention and take care at work. But it is wrong to believe that telling people to take more care is sufficient to control risks, or to meet the requirements of the principles of prevention and the hierarchy of control.

When considering behaviour and 'unsafe acts', it is not just the frontline workers who should be considered, but also the behaviour, decisions, and 'unsafe acts' of management, everyone else, and the organisation as a whole. This is why the HSE refers to human factors which cover all levels within an organisation, include the factors and influences that lead to particular decisions or behaviour, and consider why they are able to have such a detrimental effect or are not guarded against.

Bhav sometimes forms part of a wider safety culture system, but a HSE briefing on safety culture makes it clear that "Many companies talk about 'safety culture' when referring to the inclination of their employees to comply with rules or act safely. However, we [the HSE] often find that the culture and style of management is even more significant, for example a natural, unconscious bias for production over safety, or a tendency to focus on the short term, or being highly reactive."

Management decisions, etc. are usually excluded from bhav and other safety initiatives. But with such management and organisational factors having a large influence on accidents and incidents (either directly or through their impact on the behaviours of employees) senior managers must have their own perceptions and behaviours examined and challenged.

A safety climate survey which asks workers for their opinion of health and safety at work and on their managers/employers approach to health and safety can provide a snapshot of the organisation's safety culture. One example is the PABIAC Safety Climate Survey (see appendix 7).

Case Study

The 2012 Olympics

The 2012 Olympics required a substantial building project. This was achieved without one workplace death and with a significantly lower level of injury than is usual in the construction industry. HSE research has identified that there were a number of factors that lead to this, including:

- 1) Leadership – the Olympic Delivery Authority (ODA) demonstrated clear expectations as to the standards contractors were expected to achieve. Chief executives of contractors had to give reports to the ODA Board, and the importance of health and safety was led by example from the top.
- 2) Positive behaviour by workers was encouraged, as opposed to the punishment of "bad" behaviour which can have other/unintended consequences. There were competitions and prizes for good health and safety practice, donations to charities for submitted observations of good and bad practice (which were used anonymously to learn lessons), and even rewards where a worker stopped unsafe work (thereby empowering and encouraging workers to take such a step).
- 3) Management recognised the effect that their decisions could have on health and safety, and recognised the natural possibility of human error (so appropriate systems were put in place to account for these).
- 4) Workers were involved in risk assessing and developing procedures so that the real risks were covered, and to ensure that the procedures and measures to prevent or reduce the risk were usable and effective. There were adequate resources to ensure discussion and that agreed

solutions were followed through.

- 5) Organisational commitment – it was recognised that work would stop if necessary to get safety right.

It is also true that there was strong involvement from relevant unions and the enforcing authorities (who ‘police’ health and safety).

In this way, it can be seen that the 2012 Olympics used the most positive side of bhav as part of a wider safety climate approach, avoided many of the pitfalls of bhav systems, and also benefited from a tripartite approach to health and safety with the combined efforts of the employers, enforcers, and unions.

Case Study

A good example of where natural tiredness and loss of attention has been controlled by good risk management

The organisation employed a number of workers whose jobs were safety critical. The job involved several human factors problems, including no alternative but spending long periods of time at the task, with workers therefore susceptible to fatigue and loss of alertness. These could increase the probability of human error. The workers, by the need to have 24-hour cover, were also shift workers and therefore may have experienced disturbed sleep patterns and shortened sleep periods. The employer wanted to modify the workers' rosters without compromising safety levels and while maintaining high levels of alertness.

As a result of a survey and investigation, shift rosters were redesigned to reduce the disruptions of circadian rhythms (the biological body clock that gives humans their 24-hour sleep/wake cycle). The changes included a clockwise start time shift rotation and a reduction in the number of consecutive days worked. Changes were also made to the work environment with design improvements to maintain alertness including improvements to the seats provided, installation of window blinds, and the provision of workstation fans. Facial wipes were also

provided, as was a quiet room with a reclining chair to enable a short nap or period of relaxation during recognised breaks.

The employer estimates that the changes are likely to reduce safety-related incidents caused by ‘worker error’ to the value of £51,000, with potential additional benefits from reduced levels of absenteeism and sickness. Other similar employers are now expressing an interest.

Appendix 5

Case studies where it would be easy to wrongly blame the worker or where bhav made no difference to decisions made higher up

Case study

Worker at first blamed, but better design removed the hazard

A worker was burned with acid while taking a routine sample. Management began by blaming him for not wearing protective clothing and threatened to discipline anyone else not doing so. The union demanded a joint investigation. This found that the “root cause” of the incident was the unnecessarily hazardous procedure. An open cup was held under a valve on a pressurised pipe, so acid splashes were known to happen. Better design removed the hazard. Samples are now taken by placing the cups within enclosed boxes with glass doors, and with the valves operated from the outside once the doors are shut.

Case study

Almost bound to happen

Brent Churchill, a lineman for Central Maine Power, was electrocuted in 2000 after failing to put his insulating gloves on before reaching for a 7,200-volt cable. So he made a mistake that led to his death. But was this the cause of his death? Because of compulsory overtime, Brent had slept for only five hours during the previous two and a half days. How

many of us could function properly with so little sleep? His death helped to pass the first law placing a limit on working hours in Maine, USA.

Case studies Management failures

The space shuttle disasters, Challenger in 1986, and Columbia in 2003, occurred because of design flaws and decisions by senior managers. With Challenger, managers agreed to a launch that the engineers opposed. With Columbia, they decided to ignore damage suffered during takeoff.

Eleven men died in the 1994 Moura mine disaster in Queensland. On the night, the levels of explosive gas in the mine were rising - it was a virtual time bomb set to go off, regardless of who was underground or what they were doing. Management should never have sent men underground that night. They also decided not to withdraw them despite approaching what they knew to be an increasingly dangerous state.

See also the case studies on BP and Du Pont in appendix 2.

Appendix 6 The principles of prevention and the hierarchy of control

The "principles of prevention" are the guiding rules of how hazards should be prevented and risks controlled.

- 1) Avoid the risk (or hazard). For example clean upstairs windows from the ground by using an extendable pole and thereby avoid the risk of a fall from height.
- 2) Evaluate (assess) the risks which cannot be avoided.
- 3) Combat the risk at source. If for example, materials are received in heavy packages, ask for smaller packages or units to be delivered.

- 4) Adapt the work to the individual (especially the design of workplaces, choice of work equipment, and ways of working).
- 5) Adapt to technical progress and advances which may be safer.
- 6) Replace the dangerous with the non-dangerous or less dangerous. For example, use water based paint in place of solvent based paint.
- 7) Develop a consistent and logical prevention policy to cover all the areas of work.
- 8) Prioritise collective protective measures over individual protective measures. For example if there is a risk of a fall from a work platform, install a barrier in preference to providing safety harnesses.
- 9) Give appropriate instructions to employees.

The "hierarchy of control" requires employers to consider the control measures in the order they are listed, from the top down.

- 1) Elimination - redesign the job or change to a safe substance so that the hazard is removed or eliminated. For example, avoid working at height where possible. Where this is not possible: -
- 2) Substitution - replace the material or process with a less hazardous one. For example, use a cherry-picker for work at height instead of step ladders. However, care should be taken to ensure that the alternative is safer than the original.
- 3) Engineering Controls - use work equipment or other measures to prevent falls where you cannot avoid working at height. Install or use additional machinery such as local exhaust ventilation to control risks from dust or fumes. Separate the hazard from operators by methods such as enclosing or guarding dangerous items of machinery or equipment. Give priority to measures which protect collectively over individual measures.

- 4) Administrative Controls - these are all about identifying and implementing the procedures you need to work safely. For example: reducing the time workers are exposed to hazards (e.g. by job rotation), prohibiting eating or drinking in hazardous areas, increasing safety signage, and performing risk assessments.
- 5) Personal Protective Equipment (PPE - including protective clothing) - this must only be used after all the above previous measures have been tried and found to be ineffective in controlling risks to a reasonable level. For example, where you cannot eliminate the risk of a fall, use work equipment or other measures to minimise the distance and consequences of a fall (if one was to occur). If chosen, PPE should be selected and fitted by the person who uses it. Workers must be trained in the use and limitation of each item of PPE.

See UNISON's guide on risk assessment (further details in appendix 7) for more detail on the hierarchy of control and the general principles of prevention.

UNISON's guide on Risk Assessment, stock item 1351 can be found in UNISON's online catalogue from here: unison.org.uk/for-activists/help-and-advice/communicating/online-catalogue/

The HSE has a checklist for employers which, although not dismissive of bhav, does highlight some of the problems: hse.gov.uk/humanfactors/topics/behaviouralintor.htm

A HSE briefing on safety culture is at: hse.gov.uk/humanfactors/topics/07culture.pdf

The effectiveness and impact of the PABIAC initiative in reducing accidents in the paper industry is at: hse.gov.uk/research/crr_htm/2002/crr02452.htm

The HSE guide, Reducing Error and Influencing Behaviour (HSG48) is at: hse.gov.uk/pubns/priced/hsg48.pdf

For a more academic but interesting view go to: <https://digitalcollections.anu.edu.au/bitstream/1885/43176/2/hopkins36.pdf>

Appendix 7

Further sources of information

Most materials on bhav are written by the companies that develop and sell the programmes. However, the alternative resources listed below may be of interest and use.

Hazards Magazine has produced a number of useful articles and further links on the issue at: hazards.org/bs/index.htm

The TUC guide on Behavioural Safety is at: tuc.org.uk/workplace-issues/health-and-safety/guides-and-reports-reps/safety-representatives/behavioural-safety

The TUC's report on The Union Effect is at: tuc.org.uk/workplace-issues/health-and-safety/organisation/worker-involvement/union-effect

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