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BEHAVIOUR BASED SAFETY GUIDE

DOING WHAT WE DO
BETTER, SMARTER, SAFER

Our vision:

A country where worker safety, health and welfare and the safe management of chemicals are central to successful enterprise

Foreword

More and more we need to look at new approaches to achieving safe and healthy workplaces. We need to apply the learning from the many years of analyses of accidents and ill health because this will contribute to future prevention strategies and activities. Behaviour Based Safety (BBS) is an approach that we believe can be applied successfully; it is gaining more interest across industry sectors globally and has the great advantage of needing the involvement of the individual employee, in addition of course, to employer commitment.

How often have we experienced situations in which an employee's competence in a work process is assessed at the point that they leave the training room with the assumption that, once learned, the process will be applied correctly and safely?

This fails to take account of the many factors that influence and reinforce learning and behaviours. BBS addresses these factors. It is closely linked to company culture and values and, most importantly, when it works, it is an excellent tool to improve safety performance in the workplace.

In developing this guide we have been privileged to have worked with a group of people from companies that are committed to the principles of BBS and on whom we can count to promote the message. We hope that many more employers and employees become interested in the potential of the approaches set out and that we have added another useful and practical tool for improving safety and health performance.

Our thanks go to all who have been of assistance, provided insights and shared their considerable expertise to help in the development of the guide.

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Various approaches have had reasonable success in reducing unsafe behaviours in the workplace. Some involve penalties; others involve surveillance; others involve guidance, codes and procedures to follow; others still are supportive and training-oriented.

Some initiatives come from the employer, from the social partner organisations, from state regulatory bodies, and some worthwhile initiatives come from individual employees' own insights, ideas, training and development activities around health and safety.

Most employers and employees in the area of safety will agree that the ultimate aim of a safety initiative is a **"total safety culture"**; however, this concept is rarely defined. A total safety culture is a culture in which:

a) individuals hold safety as a 'value' and not just a priority;

b) individuals take responsibility for the safety of their co-workers in addition to themselves; and

c) all level of employee are willing and able to act on their sense of responsibility – they can go 'beyond the call of duty' (Perdue, 2000).

The following are some requirements for any approach to safety at work that brings about noticeable, lasting results and contributes to a total safety culture:

1. A strong management commitment towards maintaining and improving behavioural safety, witnessed in the regular acts of individuals at management level.

2. Respectful, trusting, open communication between management and employee groups about all aspects of safety in the workplace.

3. An open, feedback-rich culture among employees, which enables employees to consistently learn and grow.

4. A commitment to improving the profile of and attitude to health and safety, and increased employee engagement in safety.

5. An emphasis on safe and unsafe behaviour; not a sole dependence on lagging indicators such as safety statistics.

6. A strong, consistent, timely reaction to the discovery of unsafe acts, whether they result in injury or not. Safety incidents are viewed as an opportunity to learn and improve.

7. Generally transparent and fair leadership from all, including managers, supervisors, and owners.

8. Awareness amongst all staff of different ways to consider or query human factors – how we do what we do, and why.

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What is a Behaviour-Based Safety (BBS) approach?

This guide is informed by the field of Behaviour-Based Safety (BBS), which is often described as a bottom-up approach (frontline employees), with top-down support from safety leaders. A behaviour-based safety approach promotes interventions that are people-focused and often incorporate one-to-one or group observations of employees performing routine work tasks, setting goals carefully and giving timely feedback on safety-related behaviour, coaching and mentoring. The initiatives have a proactive focus, encouraging individuals and their work groups to consider the potential for incident involvement, (accidents) and to assess their own behaviour as safe or unsafe always, no matter what.

A BBS approach is one which:

- Is based on solid principles about engaging, motivating, assisting, reinforcing, and sustaining safe behaviours.

- Takes a systematic approach, examining the motivation underlying behaviours, in order to increase safe behaviour.

- Is an ongoing effort; not 'once-off' provisions, but a new way of working that the safety leader must continually promote for sustainable, positive results.

- Takes time to achieve; however, results can be observed immediately due to the nature of measurement involved.

- Emphasises increasing safe behaviours rather than focusing on length of time without injury. BBS programmes do not depend solely on 'lagging indicators' (after the fact), and instead shift the focus to 'leading indicators' (preventative).

- Is not a substitute for an already existing comprehensive health and safety programme; it is a supplementary tool that will enhance the effect of already existing practices, and will allow for an objective measurement system.

- Aims to understand causes of incidents and near misses and correct them through the behaviour of relevant people. For example, reducing hazards often requires behaviour change of managers and frontline workers, and equipment redesign involves behaviour change of engineers.

"BBS is about everyone's behaviour, not just the frontline" (Agnew & Ashworth, 2012)

BBS stems from the field of organisational behaviour analysis. The focus in both organisational behaviour analysis and BBS is behaviour. The overarching theme in behaviour analysis and BBS is that behaviour is maintained by what occurs after it (consequences).

Many safety interventions in work settings focus on antecedents, or events that come before behaviour that may evoke behaviour. For example, many work settings rely heavily on training, safety signs, pep talks, toolbox talks, or pre-briefs. These can be effective in activating behaviours initially, but it is what occurs after our behaviour that ensures the behaviour will occur time and time again.

For example, a toolbox talk addressing correct manual handling techniques might result in correct techniques on the day of the talk; however, over time employees will revert to old practices. This is because nothing has occurred after their correct behaviour to indicate that it is correct, or that it has benefitted the individual or the organisation to be so safety-conscious.

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Within BBS, behaviour is explained in terms of the ABC model (Antecedent, Behaviour, Consequence).

Antecedent ⟶	Behaviour ⟷	Consequence
A stimulus or event that occurs before a behaviour in time. This stimulus or event may result in the behaviour. Work examples include goals, policies, training, job aids, guides.	Anything that we can see an individual do, or say.	A stimulus or event that occurs after a behaviour in time. This consequence could increase or decrease behaviour in the future, depending on its reinforcing or punishing properties. Work examples include feedback, recognition, task completion, goal achievement, rewards.

Despite the fact that we rely heavily on antecedents, it is consequences that have the greatest influence on behaviour.

When we examine an incident report and ask questions around why a person behaved in a certain way, we tend to look at antecedents, or what occurred to 'set off' the behaviour. However, if we examine the report with a view to consequences, we will gain a clearer picture of why the behaviour occurred. For example, if an eye injury occurred and the individual was not wearing PPE, we need to examine what were the consequences for wearing the PPE (e.g., possible but not definite reduction of injury) and what were the consequences for not wearing PPE (e.g., immediate comfort, better vision on the job).

- Examination of consequences can reveal that in some instances it is actually more preferable to not wear safety equipment. **It is the job of a safety leader to ensure that it is more preferable to engage in safe behaviour.**

This guide will examine the process that occurs when a consequence leads to increases in behaviour, reinforcement, and how we can increase safe behaviour through reinforcement. The document will then outline steps to an effective behavioural safety programme, and will conclude with a case study highlighting the positive effects of a BBS programme.

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Reinforcement

Reinforcement occurs when a consequence that follows a behaviour makes it more likely that the behaviour will occur again in the future. Therefore, a reinforcing consequence is one that causes behaviour to occur more frequently.

- For example, the behaviour of putting money in a snack vending machine and pressing a button has the consequence of the chosen food item being distributed. The presentation of the food item functions as reinforcement for putting the money in and pressing the button. If the person using the vending machine actually wanted the food item then they will repeat this behaviour in the future (because it was successfully accomplished).

Essentially, everything we do changes our environment in some way (consequences). When the environment changes in a way that we like, then we will repeat the behaviour that led to the change (reinforcement).

We can increase performance through negative and positive reinforcement.

- Negative simply means taking away something (e.g., closing a window removes a cold breeze), and

- Positive means adding something (e.g., turning on a light switch results in the addition of light).

Negative Reinforcement

A lot of what we do is to avoid something, so we behave to get rid of the thing we don't want – this is negative reinforcement.

For example, if you wear PPE to avoid a fine (that might occur for not wearing PPE), this is you working under negative reinforcement. Your 'wearing PPE' behaviour has increased in order to avoid a bad situation.

Doing something to avoid punishment or aversive conditions will not inspire great or creative performance. We get by, but we are not motivated to improve – we are motivated by fear! Working because we 'have to' will get sufficient performance, but working because we 'want to' will mean we get maximum performance (Daniels, 2000).

In many organisations, work is typically carried out under negative reinforcement conditions (i.e. because we 'have to'). This results in adequate performance; employees do enough to satisfy a compliance standard, but they do not go that extra mile. On the other hand, working under positive reinforcement conditions can result in employees going above and beyond their job duties, and employees will take personal account for safety. If employees work under positive reinforcement conditions (i.e. because they 'want to'), then they will be: 1) working towards something good (as opposed to avoiding a negative), 2) motivated to work, which might result in 3) creative thinking, employing new strategies, successful decision making, seeking more responsibility.

Positive Reinforcement

In work settings it is less common to see individuals working under positive reinforcement conditions; however, it is preferable. Positive reinforcement leads to durable behaviour change, and happier employees!

For example, if you wear PPE because you feel like you are contributing to safety in your organisation (by taking personal control of safety), you will be more likely to wear PPE when your boss is not present, in situations in which it is not mandatory, and you may well begin to exhibit other safe behaviours in addition to this, voluntarily.

Doing something that results in positive reinforcement promotes strong, durable behaviour change, in addition to other new positive behaviours.

When we talk about reinforcement, we refer to the consequence that increases behaviour as a reinforcer.

- A reinforcer is anything that is added following a behaviour that increases that behaviour in the future.

- This could be recognition, praise, money, or anything at all that is provided after our behaviour.

- As a basic example, when two people are having a conversation, they are reinforcing each others 'conversation' behaviour. If one person stopped talking, then reinforcement would no longer be present and the conversation would cease. Reinforcers are around us in our environment and maintain our behaviours all of the time.

- A successful leader will identify their employees reinforcers through observing what motivates their employees, and by trying out potential reinforcers, for example, increasing positive feedback to see if that increases safe behaviour.

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Feedback is information given to an individual or a group about their behaviour and its impact (Braksick, 2007), and is one of the **most important communication tools in helping people stay healthy and safe.** Feedback can take many shapes and forms, and generally in a work setting feedback is a combination of positive and constructive information.

A feedback-rich environment enhances both communication and motivation. Positive feedback can act as a consequence that increases behaviour (reinforcement). Feedback lets us know that we are performing the correct behaviours – positive feedback should be specific in pinpointing the exact behaviours that warrant positive praise. For example, instead of saying "nice work Bill", saying "Bill, your housekeeping skills are so impressive. My path is always clear walking through your workspace", will convey exactly to Bill what he has done to impress the person delivering the feedback. If individuals receive feedback telling them that they are doing 'the right thing', then they will most likely increase that behaviour, provided the feedback is *specific and genuine.*

Sometimes it is necessary to deliver constructive feedback. Constructive feedback refers to when clear non judgmental instructions are given to the individual on what behaviours they need to change to reach the desired behaviours'. If positive feedback is delivered on a ratio of 5:1 to constructive feedback, then it will be easier for the communicator to deliver the constructive

feedback, and for the listener to receive the feedback. If a person is habituated to receiving positive feedback, when he/she receives constructive feedback indicating that a change in behaviour is required, the person will make the changes, particularly if a goal is set around the new behaviour. We often 'do' incorrect things because we haven't been shown how to do the correct things.

When delivering constructive feedback, remember:

- Constructive feedback should be used as a tool to teach and learn the correct way to complete a task or 'do' a behaviour.

- It should be viewed as a training mechanism, and if delivered correctly, employees should want to receive constructive feedback.

Using feedback in conjunction with goal setting provides a clear objective for the individual, so a combination of goal setting and frequent feedback produces maximal behaviour change.

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Research into motivation and behaviour change tells us that setting goals leads to better results and that 'what gets measured gets done'. A person who is encouraged to get sixty letters typed in a day is far more likely to succeed than a person who is told to 'do their best'. Likewise, if there is any room for ambiguous interpretation, it is crucial to elaborate, e.g., rather than saying 'Overalls should be worn correctly', say, 'Overalls should be done up to the neck with sleeves outside gauntlet gloves'. It is better to be specific than vague, to aim higher than lower and to get participation and engagement from the start. Safety should always be at the core of goal setting: saying 'Do it by Friday but do it safely' rather than 'Do it safely but do it by Friday' puts the emphasis on safety as the most important factor, not the deadline.

Most research shows that when goal setting is matched with feedback in a systematic way, the target behaviour change is even more likely to occur. When setting goals, managers, supervisors, parents, teachers and bosses often forget the delivery of feedback. If a person sets out to learn new methods or systems, to reach a target, to strive to improve or re-skill in some way, they need feedback. Setting a goal acts as an antecedent that specifies what goal-directed behaviour should occur, and feedback acts as a reinforcer – the goal sets off the behaviour and the feedback reinforces the behaviour. Behaviour-based safety interventions reinforce safe behaviour via one-to-one, group and site-wide feedback.

Goal setting means simply what it says:

- Choose a goal relating to an activity - on a warehouse floor, 'use of machinery' could be the target activity.

- Then choose a goal for that activity, e.g. 'always travel at or below the recommended speed when operating a forklift truck'.

- Agree that goal with those using the machinery and those in that vicinity.

- Agree upon a measurement system to determine progress towards the goal.

In order for a goal to be 'reasonable', those performing the behaviour must agree, to some extent, that it is reasonable. They may believe it to be too high, or too hard, but they must, at a basic level, accept that it is do-able and that they can achieve it. In order for this to occur, a discussion must take place to ensure that the goal chosen is a worthwhile one. Apathy and cynicism result when silly or meaningless goals are chosen. So, the first phase is to agree a goal activity and then set a difficult, but do-able, standard to be met, a time frame in which to meet that target, and a way to measure goal-directed behaviour. For complex goals, set targets in between so that the effort is staggered incrementally. Ensure that people know the most efficient way to complete the task, that the new goal is applied fairly, and that everyone knows what they have to do and by what deadline.

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What is Involved in a BBS Programme?

Having explored reinforcement, feedback and goal setting, the next section of this guide will briefly outline the steps to a BBS intervention. It is recommended that the reference section at the end of the document be consulted prior to implementation of a BBS programme.

1. A design team is created

The most effective way to run a BBS programme is to initially set up a design team. The design team should consist of management and frontline employees, and each member of the team should have heard about BBS and volunteer to be on the team. This team will design the BBS system, however all employees will be involved in implementation.

2. Target behaviours are chosen from safety incidents, near miss reporting, safety audits and observation

Firstly, the design team picks targeted areas/tasks. The team can use data that the site already has; results of safety audits, safety data, information from safety meetings and informal interviews with staff (from the past 5 years if possible). This will provide a wealth of information around areas in need of improvement. The team determine what would have prevented the reported injuries; if it is not immediately obvious the team use methods like discussing how increased situation awareness might have affected the situation. From this analysis, the team will identify critical safe behaviours for an observation checklist.

3. A critical checklist is developed

The checklist is comprised of the list of safe behaviours identified in the above step. The list can be shortened according to importance of safety, frequency of occurrence, observability and overlap with other items on the list. The list should be no more than 1 sheet of paper (1 side). It helps to have definitions for everything that is being measured on the back of the checklist – try not to leave anything up to subjective interpretation. The best way to know if the checklist is useable is to observe an employee working, and see if all categories on the list can be filled out in an observation. The list will need to be revised a number of times before it can be considered ready-to-use.

4. Ensure that you have a measurement system

The measurement system for an observation programme is simply a frequency count of safe and risk behaviours during an observation. **Note of caution: measuring is an antecedent, and we need a consequence in place to strengthen the behaviour under measurement.** When measurement is used effectively, the leader can create an environment in which people actually want to be measured. This can happen when positive consequences are delivered based on the behaviour change that is observed through measurement. When employees receive specific, positive feedback about the results, then they will see a benefit, aim higher, and want to be measured.

5. Behavioural observations are carried out

Consider who will conduct the observations. Data shows that the most beneficial system is to have all employees involved in the observation process. Behavioural observations increase safety behaviours of the observed but also the observer, so encouraging employees to conduct observations on each other will benefit all employees. The team and all employees will need to decide how often observations will be conducted. Will they occur across or within departments? Will a single task or employee be observed, or a work area? Will you include contractors? – if so, try to recruit them at the design phase.

6. Feedback is delivered

The process requires careful training of employees. The observer should summarise significant positive safety behaviours that were observed and then one or two areas that require change. The feedback should be delivered as soon as possible after the observation (unless this poses a risk). **Describe** the behaviour observed, **discuss** the potential impact and **listen** to the observee – this formula can be used for both positive and corrective feedback. In addition to individual feedback by the observer, overall site feedback should be delivered. The leader should discuss the results of the observations (categorically, not personally) at safety meetings, while also providing visual feedback. The easiest and most effective way to do this is through creation of a graph. Visual feedback helps us to see how we are doing and also helps us to set goals. Leaders should respond with positive feedback about any improvements, and not respond negatively to low numbers on graphs. Instead, they should encourage objective problem solving.

7. Make use of the data

You now have valuable data that you can use to inform you on process changes. Build a review of the data into existing meetings and ensure that all staff are informed of any changes made based on the data, and that they know it was because of their contribution (as a group - no names are recorded).

8. Set improvement goals

Employees should be encouraged to participate in this, and the goals should be realistic and based on the current data. Set short goals and ensure that each employee knows what behaviour or process they need to work on to reach the goal (see goal setting section of this guide). Remember to focus on the safety process itself and not the results – attempting to manage results will ruin the integrity of the programme. Instead of setting goals to increase or decrease results, set goals around the behaviours that lead to these results (e.g., increase wearing of safety goggles from 80% to 100%).

Behavioural observations are an opportunity to deliver both positive and constructive feedback. It is a feedback session structured around observation of a particular behaviour or a set of behaviours, and a feedback-rich environment is one in which everybody is learning. An effective observation process offers:
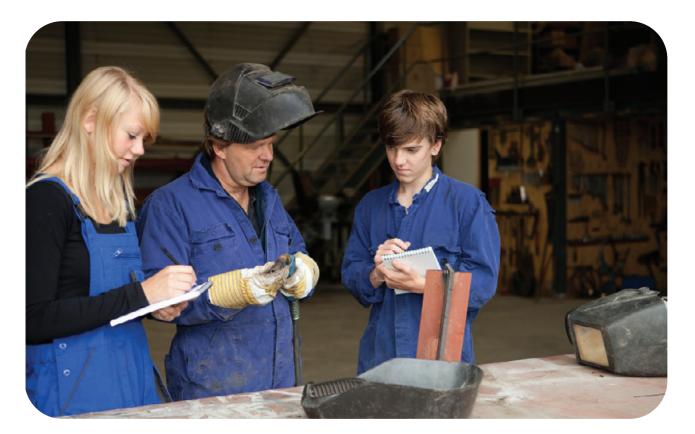
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- Feedback on the effectiveness of the safety programme

- Social consequences for safety

- A baseline for setting improvement goals

- Practice in observing and discussing safe behaviour

There are numerous benefits of using a behavioural observation approach, and it is recommended that the reader consult the reference section of this guide for examples of successful interventions. Some notable benefits of behavioural observations are:

- Improved safety practices of observers and observees;

- Increased situation awareness;

- Provides feedback on the effectiveness of safety processes;

- Provides a baseline to set improvement goals;

- Provides a forum for recognition of positive behaviours (McSween, 2003).

BBS programmes are typically driven by frontline employees; however, supervisors and managers play an integral role in promoting, modelling and reinforcing the programme. Without strong safety leaders, a BBS programme will suffer, and the expected positive results may not be observed. Managers and supervisors affect the work group in many ways:

1. Their own behaviour acts as a model for those reporting to them.
2. Their attitudes, witnessed in what they say formally and informally, for instance in the canteen as well as at the start of a shift in front of senior managers, make their mark.
3. The most important effect comes from what the supervisors really do and think, not what they say they do and think.
4. They behave 'on behalf of' large groups of employees at times where time is short or energy reduced. For instance, if employees are tired, their behaviour very much depends on what the supervisor does, says and accepts as reasonable from their group of reportees.

Safety is not flexible, yet supervisors and managers have to be. This is one difficulty with keeping a stringent, consistent approach to safety: letting someone do something unsafely even once diminishes every other attempt to do it properly. Leaders and managers can show flexibility in other matters, but not safety. Remember, there are two main requirements for employees:

• Participation and engagement on safety issues so that all employees are informed and can debate the issues.
• Total compliance with behaviours agreed to most effectively reduce errors, all the time.

Leaders play a very important role in the safety process. Leadership should not consist of auditing a performer but rather listening to the performer and asking questions, such as "are there any parts of your job that you don't see the need to do?". The leader's job is to listen and learn from their employee – one of the best ways you can build relationships is to let somebody teach you (Uhl, 2012).

With regard to the specific areas of BBS addressed in the current document, the leader plays particular important and essential parts in the process:

1. ABC model

It is the leader's responsibility to identify and communicate antecedents and consequences to safe and unsafe behaviour. If a leader can identify why an unsafe act is occurring, and what is maintaining the unsafe behaviour, then the leader is in a position to change conditions to ensure that the alternative safe behaviour results in more preferable consequences. Additionally, a strong leader will teach his/her employees to conduct ABC analyses so that all employees can identify consequences to safe and unsafe behaviour, and all can contribute positively to behaviour change.

2. Reinforcement

When consequences have been identified, a strong leader will assess whether reinforcement can be implemented for the desired safe behaviours. That is, a leader will boost social reinforcement for safe behaviours and assess whether or not this increases the safe behaviour. A strong leader will listen to his/her employees to see what they find important. For example, if an employee is discussing how he/she came up with a particular initiative, then a clever leader

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can surmise that the employee wants recognition for his input. If one-to-one recognition is not preferable to an employee, then a leader will find ways of ascertaining what motivates that employee (e.g., ask, observe).

3. Feedback

It is the leader's responsibility to deliver frequent feedback when he/she observes safe behaviour. The leader leads a feedback-rich environment; the leader doesn't just deliver the feedback, but also encourages staff to deliver feedback to each other. A strong leader can increase overall communication and motivation of a site by simply increasing positive feedback, provided the feedback is specific and genuine.

4. Goal Setting

The leader can initiate goal setting with his/her staff, which can lead to staff setting their own goals. That is, the leader can begin a goal setting culture, but as staff perform behavioural observations on each other, they will begin to set their own goals. The leader can initiate overall site goals based on the group data from behavioural observations. A strong leader will

follow-up with these goals and provide timely feedback to employees on their progress towards the goal, and recognise achievements.

5. Behavioural Observations

A successful observation programme typically involves employees conducting observations on each other; however the safety leader needs to champion the process. The leader should be involved at the design stage, and should provide continuous feedback on the success of the programme. The leader will also be responsible for any environmental or procedural changes that result from observations – there are often safety changes needed that employees do not have the authority to carry out (e.g., hazard removal).

This list of leader responsibilities is not exhaustive, and the leader plays a continuous role in promoting safety improvements at his/her worksite. Safety leaders are the role-models for personal safety, and employees will look to strong leaders to see how they should behave at work – safety leaders need to "walk the talk".

- **Set clear and realistic goals: what do you want to achieve? How will you know that you have achieved it?**

- **Pilot the intervention in a small section or department of the organisation first – pick an easy area where people are accessible, positive and in a stable environment.**

- **Contact similar companies or trade associations to discuss their interventions and experiences.**

- **Listen to your employees and use the process to improve communication.**

- **Involve employees early in the choice of programme to increase the likelihood of employee investment and participation, and so that they feel a sense of ownership.**

- **Tailor the language, style and branding of the programme to your organisation. Market it to the employees just as any product or service is marketed to them.**

- **Focus on the real root causes of errors and accidents in the workplace: not just actions, but motivations or consequences behind the actions.**

- **Always emphasise that safety is not a priority, which can change according to external factors, but a core value which must be considered in every action and task that an employee undertakes.**

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Case Study: Behavioural Intervention Over Time

In 2010, Myers, McSween, Medina, Rost and Alvero published an article providing results from a 20-year BBS intervention, highlighting the success of the programme and the durability of behaviour change over time.

The intervention took place in an oil refinery in which plant managers had expressed a clear interest in reducing injuries and improving the safety culture. An initial assessment of the previous 3 years of incident reports revealed that **unsafe employee acts** contributed to 96% of injuries. The intervention was initially introduced to one area of the refinery as this area showed the highest risk and the most past injuries. The following steps provide a brief description of the intervention:

Step 1

All employees were informed of the intervention, the rationale behind the intervention and the goals of the intervention. A thorough safety assessment was conducted to ascertain past interventions, get input from employees, identify high risk areas and activities, and identify training needs.

Step 2

A design team was created consisting of 10 employees who volunteered to take part, an area manager and a committee leader. The design team were trained on behaviour analysis and the behavioural safety process over a 3-day workshop.

Step 3

The design team identified basic safety values(e.g., teamwork, employee empowerment), and then pinpointed practices and behaviours that would be indicative of those values. Then the team created a safety process for each unit of the plant, stating the values and practices for each process.

Step 4

The design team (along with behavioural consultants) trained all employees on behavioural observation techniques and the rationale for using observation to measure safe behaviour. Employees practiced observation and delivery of feedback.

Step 5

Employees were asked to complete at least two peer observations per month using checklists that listed relevant safe behaviours. The design team reviewed the observations monthly, graphed the data, and reviewed the data in monthly safety meetings. The data taken were frequency of observations, participation, and types of safety concerns from the observations.

Step 6

Employees received monthly feedback; both verbal and visual. Lists of employee suggestions and actions taken were also posted. Rewards were delivered in the form of meals or small celebrations if the team met their monthly goals (% increase from the previous month), and managers were always present for these celebrations.

Step 7

Following implementation in the initial area of the plant, the programme was rolled out plant-wide.

Results:

Although direct observation data was taken and used to drive the intervention, injury data was consulted to view the overall success of the programme. Following intervention in the initial area of the plant, 24 months passed before the first recordable incident (this was unheard of in that area of the plant).

Overall the mean incidence rate in the refinery reduced from an average of 4 per year prior to the BBS programme, to an average of under 1 per year following introduction of the programme (lower than the industry average). Additionally, over the years, participation in the programme remained above 60% indicating a high level of employee engagement in safety.

Main lessons:

- Employees and management expressed an interest in improving safety prior to implementation – this is essential for voluntary participation.

- Provide some information highlighting the benefits of changing a behaviour.

- Train all employees on the intervention so that all can take part and contribute to behaviour change.

- Celebrate success – this does not need to be tangible rewards; it could be acknowledgement of achievement.

- Provide verbal and visual feedback. Visual feedback serves as a reminder of our success, and provides a forum to track progress.

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Any intervention in any workplace for any purpose – whether it is a BBS approach or not – should look at the organisation from a few standpoints. Firstly, as a whole, the **organisational culture** should be assessed: how are things generally done in that organisation? Does the organisational culture reflect safety-related issues or does it bypass them?

Secondly, **safety culture/climate** should be assessed with a view to basing a BBS intervention on improving a future assessment. That is, a safety culture assessment could be taken before a BBS intervention, and then again after the intervention has been in place for a period of time. The feedback from this will enhance the effects of the BBS programme, and will add a sort of 'validity' in the eyes of the employees working safely. A safety culture refers to how attitudes and beliefs about safety – long term (culture) and more recent (climate) – have come about, and what they are in the organisation. There are various ways to assess safety culture or climate, with the **survey approach** being a very popular method in recent years. This method looks at the overall group of employees and presents **individual responses** to questions in the aggregate, so that the result is a summary-type profile of the average employee. There is also the individual approach. Whilst the survey approach would give an overview, an individual approach might look to one group – say, roofers on a building site – and run a **focus group**: a meeting of a specified group of employees, for a specific purpose, in confidence, whose individual views will be prioritised and become the focus of attention for follow-up actions. The purpose of this is to ascertain what safety-related or job-specific behaviours are 'the norm' and what are unacceptable within that subgroup.

The individual approach is more time-consuming and generally requires more resources, but can be utilised well if a sectional approach is adopted, i.e. hosting a focus group with ten per cent of the employee group, and getting their views and attitudes to an item or several items concerning their safety. These are standard practice in a lot of organisations and can be used effectively in conjunction with a BBS programme.
Finally, management and organisational factors have a strong influence on accidents and incidents, either directly or through their impact on the behaviours of employees. Employees at all levels of an organisation should champion a behaviour-based safety approach, and express a genuine interest in keeping employees healthy and safe.

In sum, an effective behaviour-based safety programme should contain the following:

1. Engagement from both employees and management.

2. Clear, concise definitions of behaviours targeted for change.

3. These targeted behaviours are chosen from past incident reports, safety assessments, observation, and near miss data.

4. An observation process.

5. A feedback process.

6. Target behaviours for employees, supervisors and managers to improve, including measurement and feedback.

7. A process for identifying and remediating hazards (Agnew & Ashworth, 2012).

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