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Safety Leadership that Engages the Workforce to Create Sustainable HSE Performance

B. R. Read, SPE, Safety Leaders Group; A. Zartl-Klik; C. Veit; OMV Austria;
R. Samhaber, SPE, OMV E&P. and H. Zepic, OMV Austria

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Abstract

This paper focuses on what it takes to create sustainable HSE performance. It outlines the journey that an Oil & Gas Producer in Central Europe has taken to create a HSE Culture where health, safety and environment are an integral part of business. Since September 2004 this E&P company has been on a journey to change its HSE culture. This has required new understanding of what safety leadership actually is and the very powerful role that leadership has in engaging the workforce to create a HSE Culture which is committed to an injury free workplace.

The results achieved in HSE performance improvement that are presented in this paper are well documented through KPIs over a 5 year period. The business case and the commercial sustainability of the Safety Leadership approach is clearly presented through multi-million dollar savings. The experience of this change in approach is that it is sustainable and readily implemented; however, the fundamental principles are not well understood by many E&P companies. Many E&P companies are continuing to invest heavily in a flawed approach.

Introduction

The story of the first 18 months of this journey has been told in a previous SPE Paper (SPE 98584) presented at the 2006 SPE International Conference on Health, Safety, and Environment in Oil and Gas Exploration and Production. The results of the first 18 months were encouraging and what the authors seek to do now is detail the continued development of the understanding and application of a Safety Leadership approach that has successfully created workforce level commitment to a no incident, no harm approach to HSE. In addition to the moral imperative that everyone returns home safely, this paper presents a Return on Investment (ROI) Analysis which demonstrates the commercial advantages and a strong business case for investing in Safety Leadership and HSE.

Before we explore and discuss the results achieved in HSE performance improvement we will discuss what we have learned on this journey and what we now mean when we talk about the three key concepts in this paper. The focus of our efforts and the main theme of this paper is sustainable HSE Performance and the catalyst that initiates that performance improvement has been Safety Leadership. We think of Safety Leadership as the fuel, while the engine that really drives the performance improvement is engaged workers who are committed to Health, Safety and Environment as values. The engagement of our workers is one of the major aspects that we look for in our Safety Culture.

Creating Sustainable HSE Performance

In 2004 when OMV Austria started on this journey we knew we needed to take a different approach to what we had previously been doing. The experience of the previous 5 years had taught us that what we were doing was not sustainable and merely resulted in roller coaster results where we would observe an initial improvement in safety and results followed by a slide back to where we started. (Figure 1).

Up until 2004 we had been engaging a large global safety consulting firm whose solution required ongoing investment in layer upon layer of their safety systems. The result was an ever increasing safety bureaucracy and what we later would come to see as a management solution to a leadership issue. By mid 2004 we recognized that our current efforts were not leading to sustainable safety performance improvement.

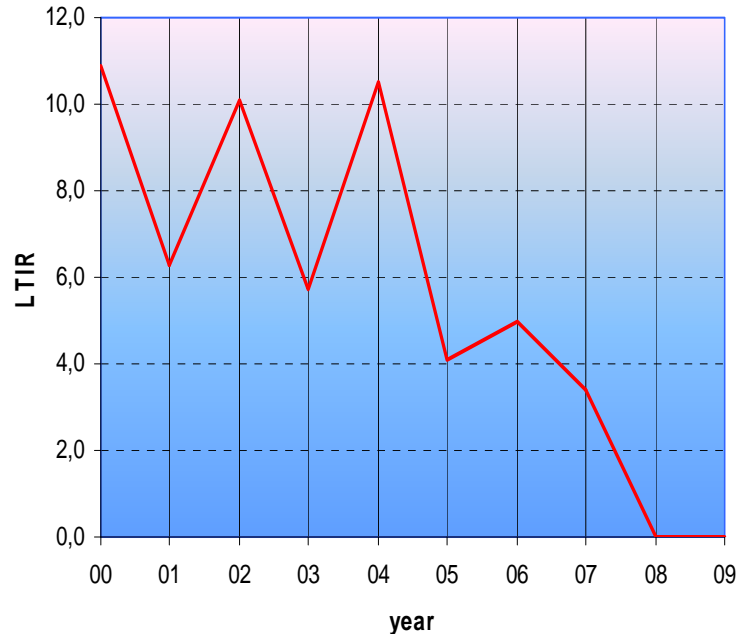


Figure 1: OMV Austria LTIR Results

As most of the industry does, we sought to keep abreast of the current thinking in HSE and what other companies in the industry were doing. In our research of different approaches we explored the work of Safety Leaders Group. The approach used by Safety Leaders Group was grounded in more than 20 years of research of significant performance improvement with organizations both in the oil and gas industry and from other industries. In addition to having a sound academic and research base their approach was founded on years of senior leadership experience with High Reliability Organizations (HRO's) and in high risk environments.

We started working on creating Sustainable Safety in Q3 2004. The results were a positive improvement on HSE performance in 2004 and the first part of 2005. In 2005 we started a major drilling campaign which resulted in a significant increase in the use of contract workers. While we continued to have improvements in HSE performance among our OMV employees we underestimated what it would take to bring the contract workers into our culture to achieve the same level of HSE performance. The impact of this is shown on the graph in the 2005 year. While we now understand this issue better, finding effective solutions to it requires constant effort and attention. As is shown in Figure 1 we achieved an LTI free year in 2008 and YTD 2009 we have been able to maintain that. The LTIR for our contract workers has dropped from 33.2 to 5.6 YTD 2009 and what we now see is that the HSE performance of our long term contractors is the same as our employees. One of the ongoing challenges for us is how we train and prepare new hires in our operations so that they can perform at the level of the rest of our people. To appreciate how we are tackling this it is necessary to understand the journey that we have been on over the last 5 years to create HSE as an integral part of our business.

The Integral View

Our work with Safety Leaders Group has assisted OMV Austria to develop an integral approach to HSE. Many companies espouse an intention for HSE to be integral in their operations, but when you ask them what that means they struggle to clearly define what integral means or what it looks like in practice. We now use a model adapted from work done by Ken Wilber in his “Theory of Integral Consciousness” (Wilber, 2003). The Integral Model (Figure 2) allows us to clearly identify what we mean by an integral approach and it enables us to communicate our intent and analyze our operations in very specific terms. Through this dialogue and our ongoing work in applying the key principles of an integral approach we have developed a new way of thinking about how to achieve sustainable safety performance and a new way of acting to eliminate and mitigate risk.

What we have learned is that to operate as a unified system requires a balance in both how we think and how we act, what we call an Integral Approach within the organization. The Integral Approach underscores the way that individual capabilities, expectations and aspirations, group systems and processes, and shared collective practices must be brought together so as to realize the purposes of the organization. The left side of the model depicts the objective dimension (how we act), and phenomena on this side of the model are observable and measurable. The right side depicts the subjective dimension (how and what we think). Phenomena on this side of the model are created in people’s minds and cannot be directly observed or measured.

The upper left quadrant is the domain of individual capability or competencies, all the things that you observe the individual doing or working with. The lower left quadrant is the domain of systems and processes, the view from outside of the group. It includes the organizational and management structures, formal and informal metrics, and formal/informal systems of acknowledgement, and recognition and respect.

The upper right quadrant is the domain of individual expectations and intentions, the view from the interior of the individual. It includes the beliefs, values, and commitments the individual brings to all situations. The lower right quadrant is the domain of culture, or shared collective practices, the view from the interior of the group. This quadrant includes the shared values, norms, and routines of the organization and defines the character and reputation of the organization. In terms of the Integral Model, these four quadrants must be constantly aligned and realigned if the organization is to achieve sustainable and effective progress towards its purpose.

Many, if not most, Oil & Gas companies struggle to achieve an integral approach and when you ask individuals where they feel more comfortable they will typically indicate the left side of the model. If we then explore where most of their time and focus (and the organization’s in most cases) is spent, they also indicate the left side of the model. When we first started exploring the concept of an integral approach we recognized this phenomenon at work in our own operations. We knew that our biggest improvements and achievements were going to come out of changes on the right side of the model, but we were spring loaded to go back to the left side and to try to identify an objective management solution to a safety problem. It is what we now refer to as a management solution to a leadership issue. Here is an example. All of the research tells us that as much as 95% of all accidents are as a result of human behaviour, but when you look into the detail more you find that in the large majority of cases the problem did not result because of competency or skills issues; they had to do with factors that sit on the right side of the integral model. We found that for the majority of our incidents and accidents this was also the case; safety issues and problems definitely had to do with factors on the right side of the integral model. However, when we reviewed the recommendations from past incident investigations almost all of the

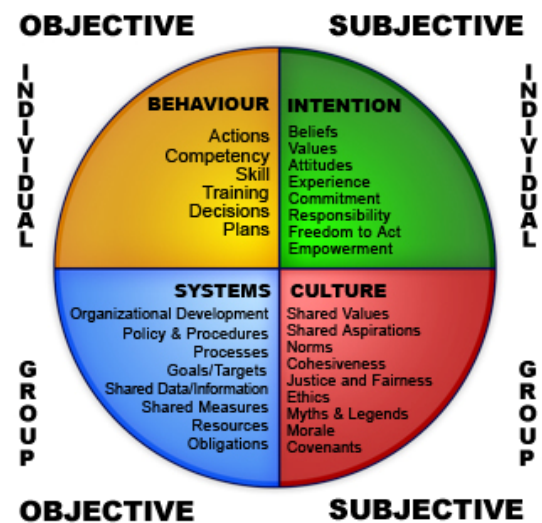


Figure 2: The Integral Model

actions were focused on the left side of the model – more systems, more audits and reviews, more checking of the checkers. Furthermore, the recommendations that were relating to phenomenon on the right side of the model were invariably vague and difficult to know whether real progress had been made or not. We were on the wrong horse and we didn't know it. So our challenge was to change our thinking, to become proficient in working on the right side of the model as well. Moreover, we didn't just want to be proficient we needed to become comfortable with operating on the right side as well as the left side of the model. Until we could do that we would never achieve an integral approach; what we needed was a new cognitive framework for our operations (Figure 3).

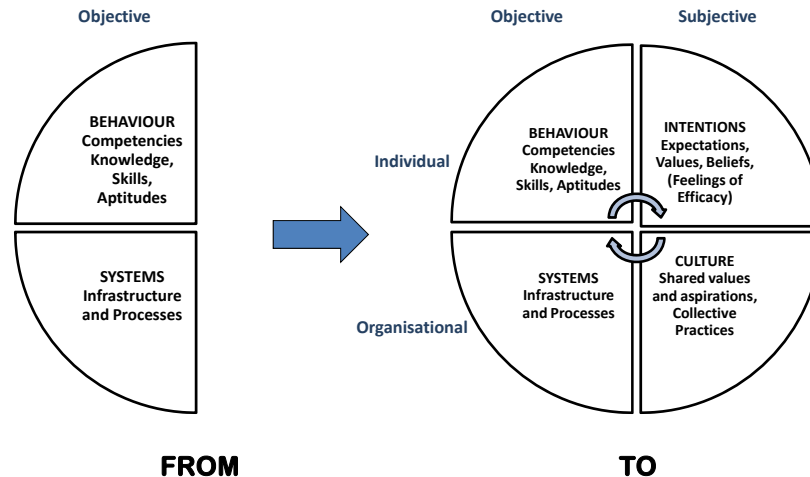


Figure 3: A New Cognitive Framework

A New Way of Thinking about Sustainable HSE

To achieve truly sustainable levels of safety performance, an Integral view of the organization is a prerequisite, as is an appreciation of the role of organizational culture in achieving and sustaining safety performance excellence.

One of the models that we have used in our work to create our HSE Culture and make HSE an integral part of our business is based on HRO's. We researched HRO's to ascertain how they were different from typical operations? In both HRO's and E&P operations unexpected things happen and these incidents result in a lapse in reliability. HRO's are different because they are observant of these lapses. They are actively on the lookout for them and they respond to them when they observe them. We recognized that these were characteristics of HRO's that we wanted to emulate. However, this is not easily done. It takes a concerted effort. It is, at its heart, about culture – shared understanding, commitment to a common purpose, an intent for specific outcomes that are clearly understood and are shared by the whole workforce and about the willingness to take action, even if unpopular or unnatural, to eliminate or mitigate risk. It is all about self-governance.

It starts with a commitment from the company's leadership to a set of standards and work practices. These then need to be clearly understood by all workers as and where they apply to them. Activities then need to be planned to happen in accordance with these standards, procedures and work practices. These plans need to be communicated to all workers involved in the operations such that the entire workforce is able to track and monitor how work is being executed. They are encouraged to ask questions and to report any and all incidents. That is, all instances of where something was supposed to happen and it didn't or where something wasn't supposed to happen and it did. This was one of our first priorities – to create a culture of reporting.

To assist in our understanding of how to achieve this we relied on the research of Safety Leaders Group who have spent the last 20 years investigating the issue of how to achieve sustainable safety performance. The model below (Figure 4) reflects the current

development of our shared understanding. The most important messages from the research and applied practice are that safety performance is first and foremost driven by core executive decisions regarding their employees. In other words, health and safety excellence starts with executive leadership. The focus of that leadership needs to be on the establishment of and commitment to collective practices, i.e. both leadership practices and work practices that have zero tolerance for anything that compromises health and safety. This model and the role of executive leadership in creating the culture is also useful in understanding the gaps that existed in industry Major Accident Events from Piper Alpha through to Texas City.

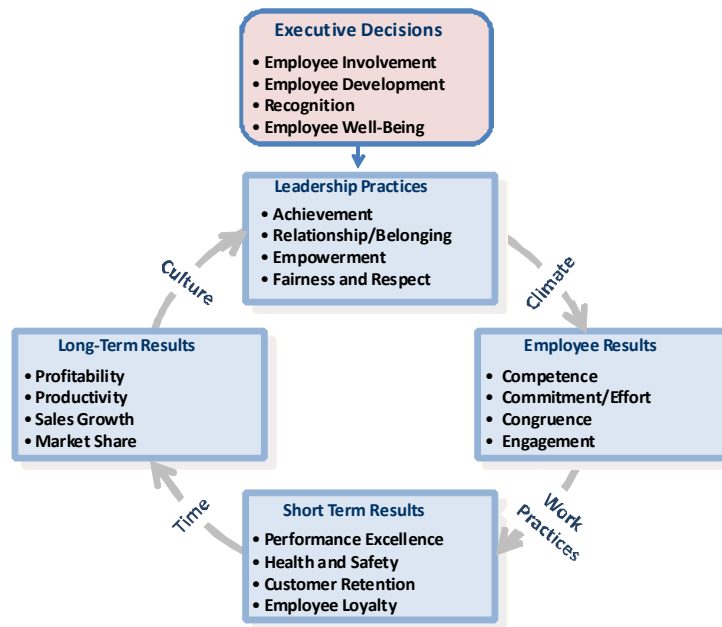


Figure 4: Creating Sustainable Safety Performance

The Sustainable Safety Performance Model is based on two streams of thought. The first is empirical. The arrows connecting the boxes represent a path of cause and effect starting with the box on the top (Executive Decisions) and then moving to Leadership Practices and then moving clockwise. The second is a view of leadership as a process of influence. Executive decisions set the stage for the evolution of the organization's shared assumptions that shape and then reinforce the organization's collective practices. The important point to note at this point is the difference between climate and culture. We can steer and create the climate through leadership practices. Culture, on the other hand, is a product of many different factors interacting over time. In this regard we don't directly create the culture; we create the right climate for the culture to develop.

Executive decisions strongly reflect and reinforce values (especially in terms of promoting or supporting employee well being and safety). These executive decisions flow through the organization and inform leadership practices and the creation of norms and work practices that support health and safety excellence. The research data suggests that when these decisions are aligned with action, then leadership practice will reflect the overriding commitment of the organization to operational excellence and health and safety (i.e. a strong safety culture).

When leadership practices are on the mark they create employee engagement. Workers will volunteer to be part of safety performance improvement and will apply considerable discretionary effort to achieving these improvements. In this environment employees choose to do the right thing. With good leadership practices you get a strong and positive climate for safety performance. This creates an environment for proactive and focused achievement oriented behaviours. Understanding the Sustainable Safety Performance Model provides clarity about how the organization's collective practices are shaped and sustained and how these are linked to sustainable performance.

Safety Leadership

The research helped us to understand that HSE change needed to be transformational – i.e. we were not going to be able to manage our way to achieving our value of everyone goes home safely. To be successful we needed to create a shared understanding of the vision of our safety culture and then work on creating that in our operations. It is said that Michelangelo was once asked how he created the Statue of David. He supposedly answered "I started with a block of marble and I just chipped away everything that did not look like David." We believe that all things we create are created twice, first in our imagination and then in the physical world. Transforming our safety culture required exactly this process.

It was clear to us that to achieve transformational change we would need transformative, values based leadership. This only occurs where leaders are committed to the goal and truly believe in the possibility of what they are leading and motivating their people to strive for. This was achieved through a HSEQ Leaders Course which is designed to take participants on a transformative journey that encourages participants to explore and challenge their beliefs about the concept of "all incidents are preventable". The objective of this course is to provide the opportunity for leaders to get clear about their beliefs and ideally get them to a point where they are able to commit to safety as a personal value for them, that is, more than just a preference but actually the standard that they aspire to and are willing to be held accountable to; a value that drives their decisions and their behaviour. It is not possible in this paper to outline all the material in the HSEQ Leaders Course. It included the teaching of concepts, workshopping of case studies and exploration of work practices. When participants finished the course there were some key concepts that we wanted them to be very clear about, these became the core concepts that drove the right hand side of our integral approach. These concepts were:

1. **Safety as a Value.** Unless safety existed for each leader as a personal value then they would not provide the necessary safety leadership for their team.
2. **Wrong versus Missing.** We were clear that we all needed to be on this journey. We weren't going to achieve our goals simply through new equipment or better technology or better management practices; our people were the solution. If we made them **wrong** because they didn't "get it" we would fail. Many of our people (at all levels) had worked in the industry for years and often decades. There was a very different focus and commitment to safety when they first started working in the industry. We had to allow time and the opportunity for people to learn and to change their paradigm. For some this happened very quickly and for others it took more time. The thing that became clear to us was that most of our accidents were triggered by operator actions or mistakes. If we blamed the operator for the accident we made them the problem – blaming makes people the problem. Operator actions or mistakes needed to be seen as the starting point; we needed to inquire into what were we missing that allowed those actions to happen. By learning to focus on what was **missing** we started to understand the causes of the accidents. By focusing on what was missing we began to better understand what was needed. Typically, what was needed was better planning, better risk management, better communication, more empowering leadership and better co-ordination. What we were not finding was that it was just our systems, procedures or equipment that was at fault. We discovered areas where we needed better training, better competency and skills and also cases where we just needed better commitment to our systems and procedures. The difference from an organizational perspective was significant; instead of people being the problem, people were now the most important element in the solution.
3. **Keep the Message Simple.** Because we were exploring new territory we had to keep a realistic perspective on what to expect on this journey. We understood that you can't copy someone else's approach; a safety culture can't be bolted on. We had to create our culture week by week and month by month. When people were ready it was the leader's job to "chip away the next piece of marble that didn't look like David." To steer this process we created a team that we called the Safety Leadership Team (SLT). The constant challenge for the SLT was to not get into blame and justification. We became proficient at asking ourselves simple questions like: "Are we on track or off track?" Or "Is what we are doing working or not working?" This approach has a very positive impact on buy-in and support from all the various stakeholders.

Safety Culture Defined

We said that we trained our Safety Leaders to help create a consistent safety culture, let's get more specific and define what we mean when we talk about Safety Culture. A Safety Culture is more than the aggregate of all the individual intentions and commitments to Safety; just as a team is more than the sum of its individual players. Culture is like a habit. First we create the culture (habit) and then we become part of the culture (habit) and it unconsciously guides our decisions and actions. Our safety

culture is somewhat like an invisible set of guiding principles that informs people how to manage risks and do the job. These invisible principles and the thinking they create guide and become our safety practices.

The International Atomic Energy Agency defines safety culture as “that assembly of characteristics and attitudes in organizations and individuals which establishes that as an overriding priority, safety issues receive the attention warranted by their significance.” Organizations that consistently operate at world’s best practice would fit this definition.

We have adapted this definition and define Safety Culture as:

The shared understanding of the values, beliefs, experiences, memories, perceptions and paradigms that influence or drive safe behaviour and work practices in the organization.

Safety Culture is subjective by nature, but because it influences behaviour it drives objective outcomes; it has a very real effect on performance.

How Culture Works

In any organization, culture defines what is:

- Reality (what is perceived)
- Important (what is of value)
- Possible (Freedom of choice)

The way culture works is that it shapes what people perceive, what they believe to be important and critically what is possible within that environment. This means that all cultures are self-fulfilling. Culture, in effect, is like the organization’s DNA. Over time the members of a culture come to act in a manner that is consistent with the shared view of reality, values, and possibility.

Safety Leadership Defined

It is the role of our Safety Leaders to create our Safety Culture. We have observed that to be effective as safety leaders our people have to care about safety. The word *care* can be used as an acronym for the things that a safety leader does – Safety Leadership is a process with four parts:

Creating an
Achievement oriented
Relationship based
Endeavour

By **Creating**, we mean a couple things. First of all, **Creating** means that you generate, produce, form, build, construct, invent, originate, initiate, conceive, or establish something. It is Action Oriented. It is also something new and often untried, so the best Leaders could also be called Pathfinders. Does anything in this description come close to implying that you can copy or imitate someone else and hope to succeed? No, Leadership is about *creating* the *Relationship Base*. Leadership is about *creating* the *Achievement Orientation*. Leadership is about *creating* the *Endeavour*.

By **Achievement Oriented**, we mean that there is an objective in mind – a goal we deeply wish to attain. That goal is foremost in our thinking, our doing, and in particular in our being. The goal drives our planning and our actions.

By **Relationship Based**, we mean that effective leadership, the ability to influence others and accomplish what we want, is based in the strength and depth of our relationships. In other words, our ability to relate to others establishes the potential we are capable of meeting. That relationship is not limited to our interpersonal relationships, but also our relationship to the subject. Like the subject of safety. How deep is our understanding? Is it superficial, or do we really, truly understand? In Health & Safety, the

depth of our relationship is defined by our “Being” – not by our “Doing” alone. It is the understanding of who we are, our relationship to self – our “being” – that gives us the strength of conviction to prevail.

Endeavour is defined as a “purposeful or industrious undertaking (especially one that requires effort or boldness)” or an “earnest and conscientious activity intended to do or accomplish something”. It is a journey toward accomplishment. It is most simply: **“Committed Action”**.

Safety Leadership was the stepping off point on the journey to sustainable HSE. Getting this right was the first part to creating the right safety culture. We came to realize that to be successful our leaders at all levels had to care about safety; they had to show they were committed. If the leader doesn’t care about safety their workers will always struggle. The most effective way that leaders showed they were committed was by getting out of their office and engaging the workforce. However, there was more to it than just leadership. Safety Leaders are one part of the solution, having workers who are skilled, competent and motivated to perform is also essential.

Engaging Workers in HSE

How do you create an engaged, self-governing work force? This was the second leg on our journey toward creating a safety culture. In this section of the paper the authors wish to share with the reader some key concepts and understanding that drove our thinking and our approach to safety cultural change. These concepts were not taught to OMV Austria field staff but they were instrumental in the design of the overall approach and in guiding our thinking and what we focused on.

In the world of safety, there are two basic approaches to achieving sustainable improvements in safety performance. The most common of these approaches are those referred to as Behavioural Based Safety Programs. These programs are grounded in the operant learning principles that were first articulated by B. F. Skinner and promulgated by his student Aubrey Daniels. A second approach is Values Based Safety; this approach draws on research and theories rooted in expectancy and attribution theories, first developed by Julian Rotter (1973) and then extended by Albert Bandura (1997) and Martin Seligman (2002). We want to briefly discuss these two approaches and after we have finished, we think you will understand why the assumptions underlying BBS programs are erroneous and are not leading to a sustainable safety culture while those underlying expectancy theory provide powerful insight in how to create and sustain a safety culture.

Research shows that as much as 95% of incidents and injuries result from human behaviour. This is why most efforts to improve safety performance focus on the issue of controlling human behaviour. To achieve this aim organizations introduce a Behavioural Based Safety (BBS) program. Such programs are based on the principles of operant conditioning, which theorize that behaviour is controlled by its consequences. This is illustrated in the ABC Model shown in Figure 5.

For example, a circumstance at work serves as a cue or stimulus to perform a specific safety-related behaviour. This behaviour operates on the environment to eliminate the risk and if successful, it produces a consequence, the nature of which is determined by the quality of the behaviour. A ‘correct’ behaviour produces a positive consequence while an ‘incorrect’ behaviour produces a negative consequence. In either case, the relationship between the cue and the behaviour is strengthened by the nature of the consequence it produces. In other words, there is a feedback loop linking consequences and antecedents. In short, a consequence increases the frequency with which the correct behaviour occurs and decreases the frequency with which an incorrect behaviour occurs.

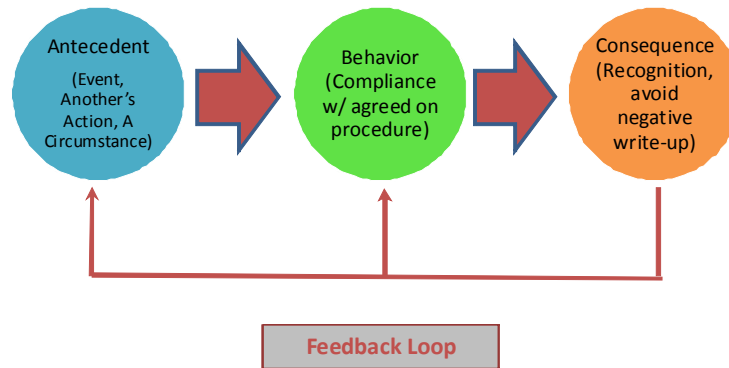


Figure 5: The ABC Model of Behavioural Control

While engaging individuals and working to create and encourage safe behaviours are essential parts of any approach to safety, BBS programs often fail to do this. The reasons for this stem from a fundamental flaw in the ABC model about the nature of human behaviour. The first reason such programs fail is that human behaviour is not controlled by consequences but by the individual's expectations, which is a belief that something will (or will not) occur. In other words, behaviour is not externally controlled by consequences but is internally controlled by a person's beliefs about the antecedent. If the person believes that something will happen when he encounters a given antecedent, then he will act in accordance with that belief, regardless of the consequence. This is why people regularly do things that, to an observer, are clearly self-defeating. Programs based on external control create compliance but not commitment and as soon as the external control is relaxed, so too is the level of compliance. These programs are not sustainable.

A second reason has to do with the way people respond to external rules. The average person is, after a while, very likely to break safety rules because this is the way their minds work – people seek to improve something or make it easier. This is why systems built on the premise of informed compliance to a set of rules generally fail in the long run.

A third reason behavioural based programs don't work as expected is that they are based on an inherent assumption of the operant approach that safety improvement is a management problem. From the management perspective, safety can be engineered into the design and operations of any system. This turns out not to be the case, because as we have pointed out, behaviour can not be externally controlled. Wise managers understand that having an inherently safe design and procedures to enable the safe operation of the equipment is just the start. Managers need to engage people so that they consistently operate the equipment within its design envelope and as per established procedures.

The message here is that people are not robots and one size does not fit all. The problem invariably is that managers implementing a typical behaviour based program think that the ABC Model allows you to predict behaviour, e.g. if a particular antecedent is present you will get a particular behaviour. If you understand the model as it is shown in Figure 5 you will see that, yes, an

antecedent will lead to behaviour, but the behaviour may be different from one individual to the next. Every individual in a sense chooses how they react to an antecedent. Their choice may be to act in a particular way or to do nothing; not reacting or not taking any action is still a behaviour. The individual controls this, not the manager.

Interviews we have conducted with employees have highlighted some of the problems with BBS programs. The feedback we got is that these programs can often be perceived in a negative way. They can be seen as focusing on failures, or catching people doing something wrong, or seen as a “dobbing on your mate”. They can focus on blaming the worker involved as being the root cause of the problem.

Managers (as compared to leaders) can easily fall into the trap of treating people like human resources and get excited by the idea of a silver bullet that will have people behave in the “right way”. An oil & gas company did exactly this when they tried to expand the application of a BBS program that had been very successfully implemented on one of their offshore platforms. The BBS program had been developed by the workers on the facility after they had been given a budget to create it. It included guides and training videos (many home grown), observer checklists for work practices that were repeatedly performed on the facility and numerous initiatives developed by the people involved in the program to help people understand what it was about, why it was being done and the part each person could play in helping each other be safer. In effect the workers on the facility had created a BBS system and a values based system interwoven in it.

Senior executives liked the results and were keen to see the program “rolled out” in other parts of the company. They attempted to unbolt the program from the one facility and bolt it on to another offshore rig operated nearby. It failed but the worst of it was that it took time to fail and, in that time, created resentment, frustration and mistrust among the very people whose support was crucial to its success. While this attempt was short lived, the negative experience of behaviour based safety programs lingered and stalled further attempts to get any program that focused on behaviours off the ground. The reason it failed is that the values based part of what the workers had created existed on the right side of the integral model (it existed in the subjective world) and therefore could not be unbolted and installed on the other rig. It was therefore incomplete and did not make sense to, nor have ownership by, the people who had been ‘given’ it.

The only way to achieve HSE as an integral part of business is to engage all workers in the safety culture and create a company of leaders. To push the bounds of safety performance people must live safety every day. Another dynamic to be aware of is that rules-based organizations (and cultures) contain an inherent tension between outside-the-box thinking and inside-the-box compliance. The kind of organization we wanted requires each individual to step up and lead, to take responsibility both for their own work and for the performance of others and this cannot be achieved by trying to manage antecedents and consequences; this can only be accomplished through values based self-governance. One of the values that is essential for working safely in an oil & gas company is a commitment to follow the rules and procedures of the organization.

Values Based Safety

Before getting to any specifics about Values Based Safety, you need to understand an important concept – the difference between procedural and value based expectations. Procedural based expectations include the rule-based expectations of each employee who works in a workgroup. This would include things like formal job expectations, the formal expectations of the company, and so on.

Value based expectations include the unobservable dimensions of personal action that are based on character and value. Procedural expectations inhabit the world of the objective; value based expectations inhabit the world of the subjective. In the procedural world people are recognized, either positively or negatively, strictly in terms of their willingness to comply with the rules. In the values based world, people are recognized in terms of their values and the choices which flow from them. The former is based on compliance and the latter on commitment.

Setting and leading expectations in the procedural world is a matter of engineering, education, and enforcement (or Control, Order, Prescribe); setting and leading expectations in the values world is a matter of value, commitment (choice), and character (Acknowledge, Commit, Empower). In the procedural world, people act safely because they feel they have to; in a values based world, people act safely because they choose to.

A subtext of this paper is that when it comes to safety there are two competing paradigms: one a behaviourally based view and the other a values based view. The former view is based on the principle of external control or compliance while the latter is based on the principle of internal control or commitment. Table 1 compares and contrasts these two views.

Compliance	Commitment
Control	Acknowledgement
Order	Commitment
Prescribe	Empower
Rules	Values
Management	Leadership
External Motivation	Internal Motivation
Compliance	Self-Governance

Table 1: Comparison of a Rules Based versus a Values Based Approach to Safety

As you can see, an underlying difference between the two is the belief that people are capable of and freely choose self-governance when they are empowered and committed to shared values. It's important here to not be under any misconception about values based safety compared to behaviour based safety and what they are focused on. They are both focused on creating safe work places and both involve the need to address the unsafe behaviours that put people at risk and lead to accidents. The difference is that BBS is based on the ABC model which is incomplete and is why BBS programs don't of themselves lead to the elimination of injuries. This is because behaviour cannot be directly controlled; behaviour is in fact a by-product. Anybody who understands how teamwork is created will intuitively understand this point.

Take the example of the boss who wanted to create high performance teams and organized teambuilding days where people ran around chanting team, team, team while thrusting their fists in the air. Meanwhile their competitor set about ensuring that leaders in their company knew the business plan, and understood how to get there. Those leaders then worked with their people and made sure that they had the necessary skills, (not the same but complementary skills) and that they were aligned and committed to a common purpose, shared performance goals and a shared approach for which they held themselves mutually accountable.

Their competitor knew that teamwork wasn't an input to be focused on, it wasn't even the output. The output for functional teams is performance and the best teams get big amounts of that. Teamwork for those that really understand it, is a by-product of doing all the other things well. It is subjective and it is created not managed. Developing a HSE Culture is exactly the same. Contrary to traditional thought, it is not developed by focusing on compliance with management systems. It actually requires a paradigm shift to leadership commitment to HSE as a way of doing business.

An important issue then is what characteristics of culture provide the necessary ingredients that cause employees to choose to strive for a level of safety that is beyond minimal efforts and exhibit self-governance around a set of core values. Our search to understand this issue has been guided by the work of Bandura (1997) and Rotter (1973) regarding the determinants of self-motivated effort. The work forms what is called efficacy theory.

A basic premise of efficacy theory is that people work in order to meet their needs (Sirota, Mischkind & Meltzer 2005). There are three primary sets of goals of all people at work: equity, achievement and belonging. Efficacy Theory asserts that employees seek to meet these three needs in any employment situation. It further asserts that, when all three needs are met, the result is high levels of commitment and motivated effort directed toward accomplishing organizational goals. This commitment and motivated effort is often referred to as engagement.

A large body of research shows that employee commitment and effort translate into stronger business performance. Jeffrey Pfeffer (1998), in his comprehensive review of the research, concludes that companies with engaged employees are 30 to 40 percent more productive. Research also shows that companies with highly engaged employees performed consistently better than their industry comparison group (Sirota et al 2005). Research has shown that the more engaged an employee is the more committed he is to the organization and his work, both rationally (as shown through effort expended) and emotionally (as shown through enthusiasm for the work). Whereas fully engaged employees are both enthusiastic and willing to work hard, less engaged employees show signs of apathy and expend only enough effort to get by (Corporate Leadership Council, 2004).

Understanding Engagement

Work enables people to meet their needs when the conditions of the work environment are conducive to them doing so. When these conditions prevail, people develop self- and collective efficacy. Efficacy is the term used by Bandura to describe the psychological state in which the person has the confident expectation that competent effort will produce a valued outcome. Rotter refers to this confidence as a generalized expectation of success. By the same token, when work does not enable people to meet their needs, they develop a generalized expectation that nothing they do matters and they act accordingly. In other words, expectations become self-fulfilling. There are three dimensions of efficacy:

- Self-efficacy – the expectation that one is competent to perform a specific task or set of tasks (*I believe I can do it*).
- Response efficacy – the expectation that performing a task will lead to the desired goal. (*I believe I will be successful*)
- Outcome expectation – the expectation that one can gain a desired reward as a result of performing a task; an individual's imagined consequences of performing particular behaviors. (*What I produce will make a positive difference*)

(The Health Psychology Reader by David F. Marks, Ed.)

We need to provide a caution here, because while we assert that people make choices that result in behaviour, we are not suggesting that people have absolute freedom to choose what they want to do. Very few people in this world have it so well put together that they are free to make whatever choices they desire. As James Reason, the author of the widely accepted Reason Model of Error, suggests “*free will is an illusion because the range of actions is always limited by the local circumstances*” (Reason, 1997). What this means is that the choices an individual may make are limited or constrained by many things, such as: their own confidence to act, their experience and their ability to know what to do, previous successes or failures, and so on.

Understanding this helps us understand why two people when presented with exactly the same situation may choose to act quite differently. This is because people are not passive respondents to antecedents; rather they process what a given input (e.g. a leadership decision/action to apply a consequence) means relative to their expectations. As a leader, it is important to understand that it is not just the local circumstances that limit actions; it is how an individual processes these local circumstances and how they choose to respond. In terms of performance and achieving success there is a simple formula you should understand:

$$\mathbf{E + R = O}$$

It stands for Event plus Response equals Outcome. How an individual processes the event and chooses their response is controlled by three things. If we link this concept of Event plus response to Efficacy Theory we can see that cognitively an individual when choosing to respond (Act) to an event will test these three things:

1. Do they believe they *can* act (self-efficacy),
2. Do they believe they will be *successful* (response efficacy), and
3. Do they believe that what they *produce* will make a positive difference (outcome efficacy).

If they answer yes to these three questions and they believe what they produce will make a positive difference for them, they will act. If they answer no to any of these three they will not be motivated to act.

OMV Austria's Journey – How this Worked in Application

In the early stages of this journey (2004 and 2005) it was identified that training was needed to raise the HSE skill and competency levels of most levels of our workforce. The table below shows the volume of training conducted.

HSEQ Training Hours

	2004	2005	2006	2007	2008	2009 YTD
HSEQ related training hours per employee	n.a.	20.1	17.25	32.09	27.90	19.0

Table 2: OMV HSEQ Training Hours

The spread of the training was as follows:

- HSE for workers (appr. 4000 hrs)
- HSE Leadership training (appr. 3000 hrs)
- HSE Orientation (appr. 2400 hrs)
- Monthly HSE induction on department related special HSE topic
- Operator Specific HSE (like PTW training etc.)

Proactive Solutions through Leadership and Lead Indicators is the Key

In OMV Austria we became very clear that one of the most important Key Performance Indicators (KPI's) to help understand how our HSE Culture was developing was the level of hazard and near miss reporting. The table below shows the significant increase in Hazard and Near Miss reporting over the last 5 years.

Hazard/Near Miss Reports 2004 to YTD 2009

	2004	2005	2006	2007	2008	2009 YTD
Hazards	0	241	915	1502	1929	1893
Near Miss	116	253	192	225	145	135
Incidents	n.a.	104	147	188	196	216
Total	116	598	1254	1915	2270	2244
# of actions	n.a.	915	1653	2055	2626	2428
% of actions closed	n.a.	99	99	97	97	91

Table 3: Hazard/Near Miss Reports 2004 to YTD 2009

While each of these reporting areas is important we recognized that our focus needed to be on lead indicators more than lag indicators, so as Safety Leaders we focused on the identification and reporting of hazards to enable a proactive approach to performance improvement. We were very clear that a sustainable culture is one which is values driven, where the motivation for being on the look-out for hazards and the desire to report them is internally driven by a commitment to a set of standards and way of operating. We needed to provide the right leadership message to motivate our workers to report hazards. To put this another

way, if our workers were not reporting hazards as we needed them to, it was a message for us that we weren't applying effective leadership practices; as safety leaders we needed to change before they would. We were concerned that we could send the wrong message and create the wrong focus if we set targets or a quota for the number of hazard reports per person or work group. As we tried different things some departments and work groups responded positively and started to regularly report hazards. Others were not as quick to actively participate. An example of such a department was Drilling and Workover. Drilling and Workover also had the highest number of accidents of all departments. Our drilling contractor was a well regarded world wide service company and they were using the STOP card system. We initially received no reporting from workover teams and the cards from the drillers were just entered into a database and were not tracked or actioned by OMV Austria. The department manager wanted to set quotas for reporting: one report (hazard or unsafe act or near miss) per workover team per week. This was discussed at length in the monthly SLT meeting and after considering the options, we adopted a "let's walk before we try to run" solution where we would set a target and continue to try to engage the work crews. We started a program called *Safety Observation* where each workover and drilling team had to report one hazard or near miss etc per week. The Loss Prevention Team collected and summarized all safety observations by the end of the week. Monday morning in the supervisor meeting all observations were discussed and measures were agreed (sometimes measures were already proposed by the workover teams). Old observations and their measures were updated. Finally this updated sheet was sent out to the workover teams and Monday afternoon each supervisor at site would guide his guys through the sheet.

At the beginning workers were against this forced reporting but once they saw that action was taken and they saw the benefits of it attitudes changed; they became engaged. Tools and work equipment that were worn were repaired or replaced; the results were visible and people could see that their workplace was becoming safer. The result was that teams accepted the reporting system as how they did things and the level of reporting and active involvement in hazard identification and incident management has continued to increase each year as shown in Figure 6. The hazard and near miss reporting appears to have plateaued in 2009 however what is actually happened was that reporting volumes remained steady while average number of contractors dropped from 885 in 2008 to 596 in 2009.

The increase in reporting and feedback from work teams has been very positive, now we had workers involved in a completely different way, if equipment had been ordered but was slow coming they would work with their Supervisors who were empowered to ask questions and be kept informed. When managers walked around and got feedback from the workgroups they heard comments that "We are kept informed, we feel more involved and up to date and don't feel like a mushroom."

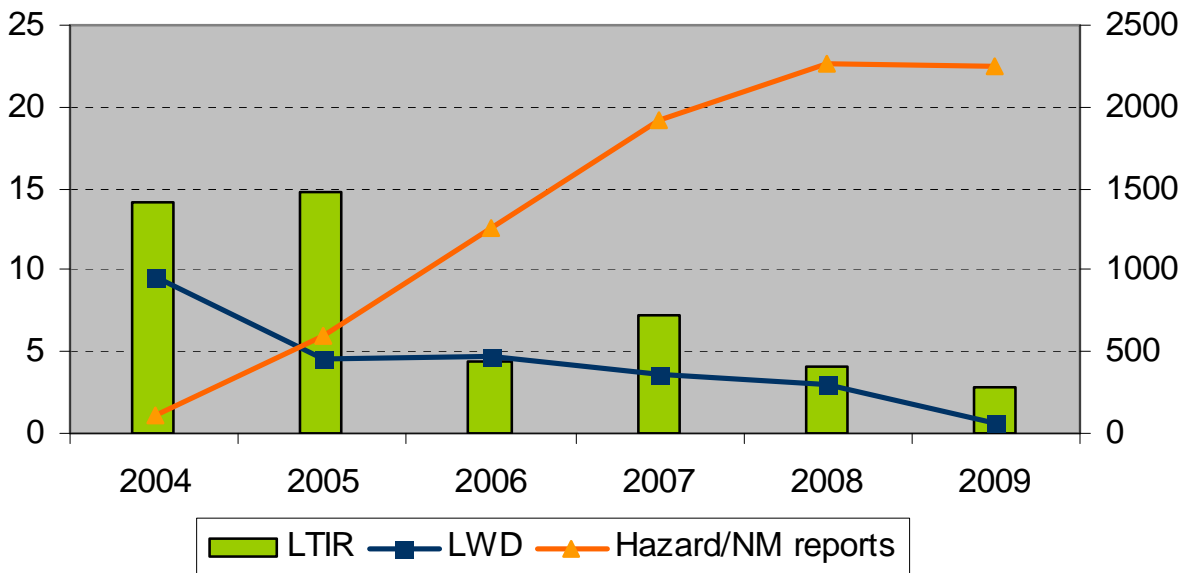


Figure 6: Hazard/Near Miss Reports Graph 2004 to YTD 2009

As involvement and commitment increased so did the level of buy-in to a way of working where work groups increasingly self-monitored and influenced members of the group to conform to group norms. This is the ideal end state but it did not happen without direction and a clear intent from our leadership. Every level of leadership had an important part to play in making the change. The key components of our success are:

1. Safety Leadership.

- ✓ Must be real and must be present out at the job site.
- ✓ What gets expected gets respected.
- ✓ Must set standards, expectations, do checks, and always treat people with respect.

2. Communication.

- ✓ Leaders must be able to break down barriers.
- ✓ Be constantly communicating/reinforcing the standards, boundaries, making sure that are well understood.
- ✓ Make the expectations clear – tell people what is expected of them.
- ✓ Make the consequences clear.

3. Actively influence behaviour.

- ✓ Be a role model – the lowest standard a leader sets is the highest standard workers will aim for.
- ✓ Be prepared – people will test the rules and the boundaries, how will you deal with this?
- ✓ Be consistent and be fair. There can be no favourites or different rules for different people.

4. Consequence Manage.

- ✓ You must follow through “Walk the Talk”.
- ✓ Acknowledge and reinforce positive behaviours. Promote the culture you want.
- ✓ Consequences must be real and must be fair.
- ✓ Safety does not happen in a vacuum; leaders have to know the Employment and Industrial Relations rules and must be prepared to act.
- ✓ Understand that your safety culture gets created each and every time you act or don't act.

Development of Systems and Tools

Increased commitment on the right hand side of the integral model served to highlight where deficiencies existed on the left side of the model. Over time we have undertaken work to improve our systems and develop our capabilities to apply or use our systems in areas such as:

- Risk Assessments
- Safety Management System, Standards, Procedures and Guidelines
- Bridging Documents
- Permit To Work
- Audits
- Investigations
- Emergency Management and Response
- Contractor Safety and relationships

Results

As has been discussed previously in this paper we have made considerable improvements in HSE performance and these results can be measured and observed in several ways. In 2008 and 2009 (YTD) we have continued to operate without lost time injury for all OMV Austria employees and a substantially lower number of injuries for contract workers. These figures are not just statistics for us; they are about the lives and the wellbeing of our friends and work colleagues. In a 5 year period we have seen the number of days where people were too unwell to come to work as a result of accidents decrease from 966 in 2004 to 62 (YTD 2009). Individuals at all levels who are involved in making this happen, feel good about this.

LTI statistics 2004 to YTD 2009

	2004	2005	2006	2007	2008	2009 YTD
total number of LTIs =LWDC	21	25	9	16	12	5
LTIR	14.2	14.8	4.4	7.2	4.1	2.8
total lost work days	966	461	475	355	306	62
Contractors						
number of LTIs	8	20	3	12	12	5
av. number of contractors	120	231	430	527	885	596
lost work days	88	390	254	271	306	62
LTIR	33.2	43.3	3.5	11.4	6.8	5.6

Table 4: Hazard/Near Miss Reports 2004 to YTD 2009

Commercial Outcomes – Return on Investment

In addition to the moral and human aspect of these achievements there are very real business and commercial results as well. Table 5 below shows the estimated costs of HSE related incidents over the period 2004 to 2009.

Estimated costs 2004 to YTD 2009 in Million Euro

	2004	2005	2006	2007	2008 YTD	2009 YTD
Cost of lost work days	1,22	0,58	0,60	0,45	0,39	0,08
Cost of HSE related incidents	not recorded	not recorded	not recorded	1,75	0,46 half year only	not recorded
TOTAL				2,20	0,85	

Table 5: Estimated Costs 2004 to YTD 2009 in Million Euro

We made the comment earlier that it isn't easy to create a culture where there is shared understanding and commitment to HSE.

There are constantly changes happening both in the internal environment in the organization and the external environment which impact HSE. Changing business demands, people changing roles, the Global Financial Crisis, have all presented challenges.

An example from our company where we struggled with this issue is shown in the table above. We wanted to be able to demonstrate that the investment in HSE was paying dividends. Our loss prevention system, had historically tracked the cost of lost work days, but it had not tracked the cost of HSE incidents that did not result in an LTI. In 2007, we started to investigate and record the cost of these incidents. We tracked these costs for calendar year 2007 and the first half of 2008, but through people changing roles, we stopped collecting this data. So unfortunately our history and the recording of our journey is somewhat incomplete. However, we feel confident that the data still tells the story. The lesson is that whatever the cost of LTI's, the actual cost to the business of other typically not recorded incidents is many times that.

From the analysis that we have done we believe a conservative figure for our operations is a multiplier of 2.5 the cost of lost work days. So in 2004 the estimated cost of HSE related incidents was in excess of €4.25 Million (US\$5.2 Million). In YTD 2009 the estimated figure is €0.28 Million (US\$0.39 Million).

The other factor that must be considered when we discuss reducing HSE incidents is the fact that every incident you don't have also eliminates the chance of that incident being an MAE. As the words of wisdom from the specialists go: "If you think safety is expensive, try having a major accident."

By creating a culture where we effectively focus on all HSE incidents we are clear that we are creating considerable tangible savings in the business, plus very real risk management in terms of exposure to an MAE.

Lessons Learned on the Journey

There is a final lesson that we would like to share about our journey. Many companies proudly proclaim that they have developed their HSE program in house. While we absolutely believe that there must be strong ownership of the program and the overall approach within the company, we believe there are many pitfalls that practitioners can fall into if they don't have the necessary level of expert understanding required to create a truly sustainable cultural change. We believe that BBS approaches that rely on the ABC model are a good example. We have learned some very important lessons while we have been on this journey. Several of them have been paradigm shifts that now allow us to see our HSE performance differently. Below is a quote that we now use to remind ourselves to constantly challenge our thinking and to question the level of our understanding:

Our acts can be no wiser than our thoughts. Our thinking can be no wiser than our understanding.

**George S. Clason (1926)
The Richest Man in Babylon**

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