

Safety Culture – Theory and Practice

Patrick Hudson
 Centre for Safety Science
 Universiteit Leiden
 P.O.Box 9555
 2300 RB Leiden
 The Netherlands
 Hudson@fsw.LeidenUniv.nl

Abstract

Safety Culture is seen as a way of ensuring high levels of safety performance in organisations, in contrast to the systematic engineered management of hazards and effects. This paper examines the notion of a safety culture in terms of the characteristics of being informed and trusting. These notions are related to more general organisational dimensions describing behaviours and attitudes. Cultures are seen as being defined by their Values, their Beliefs, their Common working Practices and also the ways in which they respond to unusual situations. In a Safety Culture these are all aligned to ensure safe operation even, or especially, when hazardous operations are undertaken. The evolutionary framework of cultures from the Pathological and the Reactive, through the Calculative or Bureaucratic to the Proactive and Generative cultures are described. The Generative culture is equated with the High Reliability Organisations identified in studies of military and civil high risk operations. Next a model is proposed for how to change organisations in order to acquire a safety culture. Finally the barriers to successful intervention are discussed. These include the nature of bureaucratic organisations, the conflicting goals of regulators, failures of management and the fact that change processes are hard.

Introduction - Why Safety Culture?

Safety is an ubiquitous concept. In some industries, such as commercial aviation, safety is so embedded into the organisation that it can be difficult to see just what the general concept of safety means, so I want to start by expanding the notion. Most people see safety as concerned primarily with the personal well-being of stakeholders, by which I mean all those involved, not just the immediate actors and owners. Some also add the integrity of the business and its assets. While these are necessary preconditions, I view safety, and more specifically safety management, in a more active way. I see the creation of a safe environment as allowing dangerous activities to take place successfully, which means without harm or damage. What this means is that safety is more than a passive and well-meaning notion, such as “Thou shall do no harm”. Instead safety is something that has to be actively managed to allow profit or advantage to be gained. The oil and gas industry is one that is naturally dangerous – fire and explosion are natural hazards of the product, mass and power inherent in the means of production. The aviation industry is another; flying is the defiance of gravity and, outside of the Zeppelin, high speeds are also inherent. In both these cases, as well as similar industries, risk is the name of the game. Even an apparently sedentary occupation, such as banking, involves risk and the potential for massive loss. Those organisations that manage their risks best are in place to make the most profit. Those that do not manage so well are either perceived as dangerous or are forced to scale down their operations to achieve acceptable levels of safety.

What has safety culture to do with this? The answer is that there are a number of ways of achieving high levels of safety. These range from having a systematic and highly controlled prescription of all activities in order to exclude the possibility of hazards ever becoming loose, to creating an organisational culture within which everyone is personally involved in ensuring the safety of all concerned, such as DuPont’s *interdependent* culture. The term safety culture can be applied to both, but they clearly represent quite different cultures. What has become clear is that there is a natural and evolutionary progression of cultures, first laid out by Westrum (1991), and that the end-point of this progression is what we call a true Safety Culture. What has also become clear more recently is that, while the road to achieving this ideal state is not an

easy one, the benefits to be gained most certainly outweigh the costs of attaining it. In particular there are advantages to be had from actually reducing the time, and especially paperwork, devoted to safety. The reason for this is that much of what takes place in managing safety in earlier stages is the direct result of a failure of trust and a lack of confidence. These shortcomings lead to over-management and, accordingly, more hard work than is necessary.

This paper first examines the notion of a safety culture and attempts to identify the components in a way that is useful. Then I will discuss how one might go about achieving the goal of being a real safety culture. Next I will discuss briefly some of the barriers that are liable to prevent the full development. Finally I will draw conclusions in which the commercial factor again plays a role.

What is a Safety Culture?

Every organisation has some common, internal, characteristics that we call its culture. These characteristics have often become invisible to those inside, but may be startling to outsiders coming from a different culture. The notion of an organisational culture is notoriously difficult to define (Furnham, 1997; Schein, 1992, 1996), so I take a very general approach and see the organisational culture as, roughly “Who and what we are, what we find important, and how we go about doing things round here”. Rousseau (1988) defined culture more specifically as “the ways of thinking, behaving and believing that members of a social unit have in common”. A safety culture is a special case of such a culture, one in which safety has a special place in the concerns of those who work for the organisation¹.

We can first distinguish culture into its static and its dynamic components. The term *static* refers to what *is*, generally the unchanging values held by the organisation, and the beliefs that permeate its members. The term *dynamic* refers to how the organisation operates, the types of work processes it feels comfortable with. Table 1 shows a set of definitions of the four major components that can be identified as constituting corporate culture (Hudson, 1998). The distinction between common working practices and problem solving methods is not always drawn, but this may be because researchers tend to study companies in either periods of stability or of great change, but not through both. Operating in a stable world highlights the daily working practices, while periods of change are dominated by problem-solving processes. The High Reliability Organisations studied by the Berkeley Group (LaPorte & Consilini, 1991) are characterised by radically different ways of operating under normal and high stress situations.

A safety culture is one in which safety plays a very important role. Because safety is such a complex phenomenon, it is not enough just to add – “And be safe”. The next sections examine the characteristics of a safety culture and look at the types of culture that can be recognised as forming a progression along which organisations develop.

The characteristics of a Safety Culture

What does an organisational culture that gives safety a priority look like? Reason (1997) has identified a number of characteristics that go to make up such a safety culture. These are:

- an *informed culture*-one in which those who manage and operate the system have current knowledge about the human, technical, organisational and environmental factors that determine the safety of the system as a whole,
- a *reporting culture*: a culture in which people are willing to report errors and near misses,
- a *just culture*: a culture of 'no blame' where an atmosphere of trust is present and people are encouraged or even rewarded for providing essential safety-related information- but where there is also a clear line between acceptable and unacceptable behaviour and,

¹ In one sense safety *always* has a place in an organisation’s culture, which can then be referred to as *the* safety culture. But it is only past a certain stage of development that an organisation can be said to take safety sufficiently seriously to be labelled as *a* safety culture, a *culture of safety*.

- a *flexible culture* which can take different forms but is characterised as shifting from the conventional hierarchical mode to a flatter professional structure.
- a *learning culture* - the willingness and the competence to draw the right conclusions from its safety information system, and the will to implement major reforms when the need is indicated.

The values associated with a safety culture are fairly straightforward. The beliefs are more complex. Taken together the five characteristics form a culture of *trust* and of *informedness*. Trust is needed, especially in the face of assaults upon the beliefs that people are trying their best, such as accidents and near-miss incidents which all too easily look like failures of individuals to come up to the ideals of the organisation. Informedness means that people know what is really happening, lessening the chance of mistakes caused by inappropriate world views. This helps us to identify what beliefs are associated with a safety culture. Table 2 places safety into the framework set in Table 1. Reason's characteristics are the outcome of corporate behaviours driven by the static and dynamic components of the corporate culture, but mostly by beliefs and behaviours rather than values. Organisations with high values may not live up to their own expectations.

Types of Safety Culture

Safety cultures can be distinguished along a line from *pathological*, caring less about safety than about not being caught, through *calculative*, blindly following all the logically necessary steps, to *generative*, in which safe behaviour is fully integrated into everything the organisation does (Westrum & Adamski, 1999; Westrum, 1991; Weick, 1987). A Culture of Safety can only be considered seriously in the later stages of this evolutionary line. Prior to that, up to and including the calculative stage, the term safety culture is best reserved to describe formal and superficial structures rather than an integral part of the overall culture, pervading how safely the organisation goes about its work. It is obvious that, at the pathological stage, an organisation is not even interested in safety and has to make the first level of acquiring the value system that includes safety as a necessary element. A subsequent stage is one in which safety issues begin to acquire importance, often driven by both internal and external factors as a result of having many incidents. At this first stage of development we can see the values beginning to be acquired, but the beliefs, methods and working practices are still at a primeval stage. At such an early stage, top management believes accidents to be caused by stupidity, inattention and, even, wilfulness on the part of their employees. Many messages may flow from on high, but the majority still reflect the organisation's primary aims, often with '*and be safe*' tacked on at the end. One cannot fail to be 'impressed' by the management of Townsend Thoreson and the messages they were sending to their work force in the run up to the Herald of Free Enterprise disaster (Sheen, 1987).

Table 1: Corporate Culture definitions

<i>Culture Component</i>	<i>Definition</i>
<i>Corporate Values</i>	What the organisation regards as important or even sacrosanct
<i>Corporate Beliefs</i>	What the organisation believes about the world, how the world will react to actions, what the outside world finds important. Beliefs about what works and doesn't
<i>Common Problem-Solving Methods</i>	How the types of problem found in the organisation are tackled, e.g. project groups, consultants, panic
<i>Common Working Practices</i>	The way people go about their work, e.g. small meetings, lots of memos, project management of everything etc.

Table 2: A Safety Culture defined in terms of the organisational components. Note that the methods and working practices are not restricted to safety, but that safety is intimately involved in the way work is done.

<i>Safety Culture Component</i>	<i>Definition</i>
<i>Safety Values</i>	The organisation regards as safety as sacrosanct and provides the licence to operate.
<i>Safety Beliefs</i>	The organisation believes that safety makes commercial sense; that individuals are not the sole causes of incidents; that the next accident is waiting to happen.
<i>Common Problem-Solving Methods</i>	Risk assessment, cost-benefit analyses, accident analysis as well as investigation, proactive search for problems in advance of incidents.
<i>Common Working Practices</i>	Safety integral to design and operations practice, safety #1 on meeting agendas up to Board level, chronic unease about safety.

The next stage, one that I feel can not be circumvented, involves the recognition that safety does need to be taken seriously. The term *calculative* is used to stress that safety is calculated; quantitative risk assessment techniques and overt cost-benefit analyses are used to justify safety and to measure the effectiveness of proposed measures. Such techniques are typical problem-solving methods. Often simple calculations suggest that failing to be safe, or at least having incidents, costs money. Furthermore organisations that are seen from outside as being uncaring about safety may have image problems that knock on to the bottom line. Despite this stance, and despite what can become an impressive safety record, safety is still an add-on, certainly when seen from outside.

Table 3: Westrum's original model.

The Reactive and the Proactive stages have been added more recently and articulated in our work in the Oil and Gas industry. Table 5 shows an extended and more practical version that was worked out, in co-operation with Westrum, with the addition of the Reactive and Proactive stages.

Pathological	Bureaucratic	Generative
Information is hidden	Information may be ignored	Information is actively sought
Messengers are "shot"	Messengers are tolerated	Messengers are trained
Responsibilities are shirked	Responsibility is compartmented	Responsibilities are shared
Bridging is discouraged	Bridging is allowed but discouraged	Bridging is rewarded
Failure is covered up	Organisation is just and merciful	Failure causes enquiry
New ideas are crushed	New ideas create problems	New ideas are welcomed

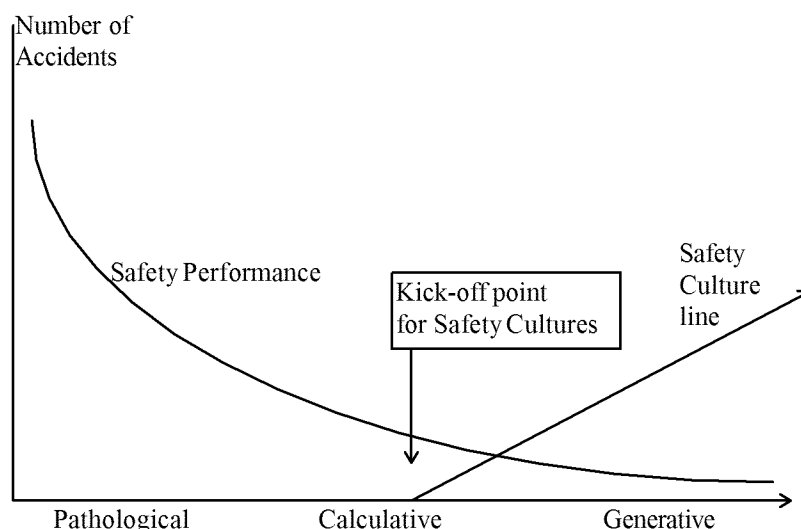


Figure 1: The safety performance will improve as the culture matures, but there can only start to be talk of a Safety Culture once the calculative stage has been passed

The foundation can now be laid, nevertheless, for acquiring *beliefs* that safety is worthwhile in its own right. By constructing deliberate procedures an organisation can force itself into taking safety seriously, or can be forced by a regulatory body, but the values are not yet fully internalised, the methods are still new and individual beliefs generally lag behind corporate intentions. This shows us a significant characteristic of a true safety culture, that the value system associated with safety and safe working has to be fully internalised as beliefs, almost to the point of invisibility, and that the entire suite of approaches the organisation uses are safety-based (Rochlin et al, 1987). What this also stresses is that the notion of a safety culture can only arise in an organisational context within which the necessary technical steps and procedures are already in place and in operation. Yet again, these are necessary but not sufficient preconditions for a safety culture (LaPorte & Consolini, 1991, Laporte, 1996, Turner & Pidgeon, 1997).

Table 4 breaks down general organisational cultures into more detail. The internals may be reflected at any cultural level, so managerial style will vary from pathological through to generative (see below). The Walk/Talk headings are intended to distinguish the more passive from the active components. Filling in these components helps define how a culture appears and how a culture should be. The next section discusses a progression of cultures.

Table 4: The Safety Culture dimensions and internal structure.
These are filled in with different descriptions for each level of the safety culture attained.
For each cell it should be possible to think in terms of the values, beliefs and practices that apply. This is done in Table 5.

TALK Communication	Organisational Attitudes	WALK Safety	Organisational Behaviour	Working Behaviour
Flow of data and information about safety	Workforce attitudes to management	Organisational status of safety Department	Managerial style and behaviour	Priority setting between production and safety
Management informedness about the true state of affairs	Management attitudes about the workforce	Rewards of good safety performance	Level of care for stakeholders	Risk appreciation by those at personal risk
Workforce informedness about the true state of affairs	Collective efficacy – the belief that people can get things done	Procedures and the use of initiative	Dealing with change	On-site behaviour by the workforce and management
		Design – safety as a starting point	Reaction to trouble when it happens	Environment seen as critical

Described in this way we can see how crucial is the notion of belief. The overt knowledge about safety, taken together with a set of values, may still not be enough when difficulties arise, although in easy times behaviour may be exemplary. In the last resort what drives a person, and I would argue an organisation, is less their knowledge than their beliefs. When knowledge clashes with belief the more deep-seated is likely to come out on top as the driver of behaviour, and beliefs, even as articles of unjustified faith, are more deep seated than any rationally acquired knowledge. The latter may be easily disproved or set aside, belief is much harder both to induce and, then, to shift.

The final stages, identified by Westrum in his studies on high reliability organisations and labelled *generative*, involve a much more proactive approach to safety. Whereas the calculative stage represents a reactive approach, using past experience to determine future behaviour, the generative approach may be characterised by a much more internalised model of *good practice* as its driver. This model becomes internalised as a set of beliefs about why and how the organisation operates, about what is the best way to do things. Assumptions about the *need* to be safe are unquestioned; everything else, in contrast, is open for discussion and improvement. A characteristic of this stage is the lack of complacency, even in the face of a dearth of accidents. This has been labelled *chronic unease*, which sums up the pessimistic stance that just because everything has gone well is just an indication that what is about to happen will be a new experience. Fortunately, chronic unease is balanced by optimistic presumption that what *does* happen can be faced and coped with. It does not imply shrinking from challenge, not pessimism elsewhere in the organisation. The generative stage can be equated to the High Reliability Organisations studied by the Berkeley Group (Rochlin et al, 1987; LaPorte & Consolini, 1991; Weick & Roberts, 1993).

One crucial difference between this stage, and prior stages in the evolution of a safety culture, is that the human factor is considered to include both the individual and the organisation. The model of human behaviour has shifted from one in which workers have to be driven, and are not to be trusted, to a more mature understanding of what makes people tick. It is only at this point that it becomes possible to understand that establishment of a safety culture is still not enough, on its own, to counter all human error because such errors may be outside of the control of the immediate perpetrator.

This review suggests that the safety culture concept includes much more than just thinking that safety is important. Work practices and overt priorities not only include safety, but the whole way in which unsafe work is perceived reflects a major shift of point of view. This shift is from regarding individuals as a source of problems for an otherwise perfect organisation to one in which organisations can cause and cure their own problems by using the people who make them up.

Table 5: A more detailed set of descriptions of the different types of safety culture.
HSE is Health, Safety and Environment. This table was defined for the Oil and Gas industry
and has served as a reliable discrimination test.

	PATHOLOGICAL	REACTIVE	CALCULATIVE	PROACTIVE	GENERATIVE
COMMUNICATION	Nobody is informed, no feedback, everybody is passive, no care/ knowledge about safety, don't see(k) or ask the problem, collect what is legally required.	Management demands data on HSE failures, denial until forced to admit, top-down flow of information, bottom-up incidents, lots of statistics nobody understands, safety hot issue after accident.	Environment of command and control by management, lots of HSE graphs, statistics but no follow up, info goes top-down, failures bottom-up, little top-down feedback, toolbox meetings, procedures exist but are only once read. Action is delayed after knowledge.	Management goes out and seek, discuss for themselves they know what to change and how to manage, the feedback loop (bottom-up and top-down) is closing at supervisory level safety topics become part of other meetings, asked for by workforce, they need detail to understand WHY accidents happen.	No threshold between management-workforce, management participates/shares activities (dialogue), HSE is nr 1, all feedback loops are closed, safety is integrated in other meetings; no special safety meetings required, workforce keeps itself up-to-date, they demand information so they can prevent problems.
ORGANISATIONAL ATTITUDES	No believe or trust, environment of punishing, blaming and controlling the workforce.	Failures caused by individuals. No blame but responsibility, workforce needs to be educated and follow the procedures, management overreacts in eyes of workforce.	Workforce is more involved, little effect on procedures, designs, practices workforce does not understand the problem, management is seen as obsessive with HSE, but they don't 'mean' it. (Walk-talk).	Workforce involvement is promoted but ruled/organised by supervisory staff which is obsessed by HSE statistics.	Management is recognised as a partner by workforce, management respects workforce, management has to fix systematic failures, workforce has to identify them.
HSE	No HSE status, HSE issues are ignored, minimal requirements, no rewards on good performance, safety is inherited but not known, reliance on experience.	Meets legal req. collects statistics but no follow up, design is changed after accidents, procedures are rewritten to prevent previous accidents no update or improvements.	HSE well accepted, advisor collects data and creates own statistics, HSE rewards for positive and negative performance, design: quantitative methods, procedures to solve unsolved problems, standard procedures preferred from the shelf, large numbers of procedures but few checks on use/knowledge.	Separate line HSE advisors promoting improvement, but try to reduce the inconvenience to line, for good HSE initiatives there is career enhancement for Sr. staff, HSE is in the early stages of design, procedures are rewritten by workforce, integration with competency, complaints about externally set targets.	HSE department is a small, advising the management on strategy, group, no special rewards, individual pride, procedures are written by workforce, continuous improvement, small numbers of procedures are integrated in training.
ORGANISATIONAL BEHAVIOUR	Denial anything is wrong, avoids HSE discussions, management is hierarchical and stagnant to changes, focus on profits not on workforce, workforce has lots of freedom-> mn don't care.	Man. Holds workforce responsible for failures, overreacting, management. States that it takes safety seriously, but is not always believed by workforce.	Detail focussed/playing with numbers, believe company is doing well in spite of contrary, targets are not challenged, inability to admit solutions may not work the first time.	Management knows the risks, interested in HSE, takes culture into account, safety priority over production which leads to incompatible goals, lots of management walkabouts, communication and assessments about accidents and near-misses and their consequences.	Safety is equal to production, enthusiastic communication between workforce and management and vv, workforce has a lot of freedom-> trust.
WORKING BEHAVIOUR	Workplace is dangerous, messy, no (legal) health requirements, management does not CARE and does not KNOWS.	Basic leg. Requirements implemented, housekeeping is temp. Improved when inspection comes, management KNOWS but not always CARES.	Clean and tidy working environment, housekeeping is very important (prizes), Management CARES but not always KNOWS.	Management CARES and KNOWS, discussion about prioritisation, time and resources are available for sit improvements even before accidents happen.	Management CARES and KNOWS, workforce furnishes its own environment, management passes the experience around to other sites

How can you achieve a Safety Culture?

We have been studying the safety culture of organisations in the oil and gas industry and it is clear that, to progress, one has to undergo a process of cultural change. These changes have to take place incrementally. It appears logical, at least, that it is impossible to go straight from the reactive to the proactive without going through the calculative stage because the proactive culture includes systems typical of the calculative. Similarly it is probably impossible to go from the pathological straight to the calculative stage.

Change Management

What has to be done for an organisation to develop along the line towards the generative or true safety cultures is a managed change process. The next culture defines *where* we want to go to, the change model determines *how* we get there. A model for developmental change has been proposed by Prochaska and DiClemente (1995). This model was originally developed for getting people off drug and other dependencies such as smoking, alcohol and over-eating. It proposes that there are five stages that the authors have identified. These stages are:

- **Precontemplation** – Not yet at a stage of considering the need for change. In safety terms a complacent belief that what can be achieved has been achieved. Coupled with the belief that further improvement is ‘not possible in this business’.
- **Contemplation** – A stage at which the realisation is arisen that further improvement is possible. There is no actual change in behaviour and no steps are taken. Nevertheless the possibility of improvement is entertained.
- **Preparation** – Active steps are taken to prepare for change (in smoking this would be characterised by trying not to buy cigarettes, by not maintaining a stock; in dieting this might involve avoiding certain eating situations, but in both cases without actually smoking or eating less). Characterised by much backsliding.
- **Action** - The stage when the practice built up in the preparation stage is put to work. The beliefs are now that it is important and possible to stop the addictive behaviour. This stage needs to be actively supported while the pull to slide backwards is actively countered (in contrast to the previous stage when backsliding is characteristic).
- **Maintenance** – This stage is vital in maintaining a new, lower baseline of behaviour. This stage needs to be kept up and can often be lost with reversion to the behaviour characteristic of preparation and action.

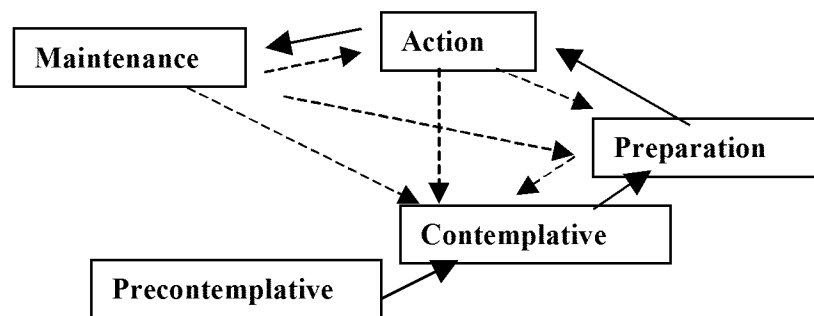


Figure II: Prochaska & DiClemente's change model. The dotted lines denote possible ways to fall back. Note that it is not possible to revert as far as the pre-contemplative mode once one has become aware. The remaining stages are, however, unfortunately quite possible as anyone who has tried to give up smoking knows.

Figure II shows the basic set of transitions from precontemplative through to maintenance, with back-sliding as dotted lines. The step back to precontemplative is not possible (i.e. the values remain intact, but beliefs in the possibility of meeting them may be severely damaged). What is contemplated will be different at each stage of safety culture, so the transition from proactive to generative includes concepts, values and beliefs incomprehensible to those at lower stages. The application of this transition process leads to a spiral when we take safety culture into account.

What is important in this model is the recognition of which stage a patient finds themselves in and the methods available to shift them through the transition from one stage to the next. The stages will require the definition of tools to determine which stage individuals and groups (in organisations) are currently in. The *transitions* that have to be made will require change tools. The term stage is used to refer to one of these treatment situations. A transition takes place between stages.

A Change Model for Organisations

A more articulated model, based upon the simpler Prochaska & DiClemente model, has been developed for managing successful change within organisations rather than individuals. This model, shown below in Table 6, puts together the requirements for change of belief that are so crucial in cultural development. What we have learned is that awareness is not enough, the creation of need and belief in the value of the outcome is equally vital in ensuring a successful process

The model, which has been recently developed in research for Shell International (Hudson et al, 2000), is very similar to any quality system Plan-Do-Check, but the internals of the stages, especially the Awareness and Planning stages, are often missed or treated very summarily. All too often, the active participation of those involved, in the awareness and planning stages, is replaced by a plan of action defined elsewhere. Such plans typically come from senior management, external corporate departments or consultants. What are needed are: (I) the creation of a personal need to change, (II) a belief in the ability to effect such change and (III) the clear understanding that individuals have control over their own process. These are factors that have been repeatedly found in the literature on motivation to influence final outcomes positively. It is just these factors we feel get to the Hearts and Minds of the workforce. When the beliefs and values associated with a new (and hopefully better) state have been assimilated and internalised, then the change has really taken place. This model can apply to safety, but it can also apply to Cost Leadership or any other desirable development in an organisational environment.

Table 6: The articulated Change Model for Organisations. Prochaska and DiClemente's original five stages are elaborated to 14 to cover the details required in real settings.

Pre-contemplation to Contemplation - AWARENESS

- *Awareness* – Simple knowledge of a 'better' alternative than the current state
- *Creation of need* – Active desire to achieve the new state
- *Making the outcome believable* – believing that the state is sensible for those involved
- *Making the outcome achievable* - making the process of achieving the new state credible for those involved
- *Information about successes* - provision of information about others who have succeeded
- *Personal vision* - definition by those involved of what *they* expect the new situation to be

Contemplation to Preparation - PLANNING

- *Plan construction* - creation by those involved of their *own* action plan
- *Measurement points* - definition of indicators of success in process
- *Commitment* - signing-up to the plan of all involved

Preparation to Action - ACTION

- *Do* - start implementing action plan
- *Review* - review progress with concentration upon successful outcomes
- *Correct* - reworking of plan where necessary

Maintenance - MAINTENANCE

- *Review* - management review of process at regular (and defined in advance) intervals
- *Outcome* - checks on internalisation of values and beliefs in outcome state

What are the barriers to success?

If there were no barriers, the development of a safety culture would never form a problem and safety cultures would abound. Why, then, do attempts fail? The reasons are to be found in the beliefs and practices that characterise an organisation and its members. In many cases organisations will naturally limit their development unless active steps are taken. In the worst cases organisations may actually revert. As all organisational cultures past the Pathological hold safety high in their value systems, reversion may appear to the participants to be less significant than it actually is.

Bureaucratic Cultures

One major reason is that the bureaucratic culture associated with the calculative safety culture is a powerful and comfortable one. An organisation that has struggled to become proactive may easily revert, especially in the face of success. Generative organisations have many characteristics that are essentially anti-bureaucratic; the hierarchical structures break down under high-tempo operations (LaPorte & Consilini, 1991). What this demonstrates when it happens is that the beliefs, usually of top management, have never really moved on. The move from proactive to generative is also hard to make because, while the calculative and proactive stages may be fairly easy to identify and therefore acquire, the generative stage is more elusive. In a sense every calculative organisation will be the same, or at least very similar, despite differences in the tasks such organisations face. A generative organisation, in contrast, will be structured in ways specific to the tasks it has to accomplish. Therefore every generative organisation is likely to be subtly different from every other one. This makes it much harder to define where one is going when trying to transit from proactive to generative. It also makes it much easier to succumb to the temptation to prefer a well-defined organisation structure over a process that is much harder to regulate.

Regulators and the Law

The Regulator, possibly surprisingly, forms a barrier to development. This will not be the case in the earlier stages, going from pathological to reactive and on to calculative. The later stages will be harder because they often involve dropping just those facets, such as specialised safety staff and extensive management systems, that regulators require (by law) and that got the organisation there in the first place. Regulators are, with some honourable exceptions, more inclined to the letter than the spirit of the law. This can mean that an experimental improvement, typical of generative and proactive organisations, may well be actively discouraged. The fact that things might well get better is often irrelevant to the legal mind. The simplest remedy for this problem is what is called a goal-setting regime, such as is found in the many offshore oil and gas industries.

The problem faced by an enlightened regulator is that the law allows few distinctions based upon track record in the face of outcomes (Hudson, in prep). What we are looking for is a regulatory regime that is measured against the aspirations of organisations and the degree to which they attempt to attain them. In this sort of regime setting almost impossible standards is laudable, while failing to meet them is not necessarily reprehensible. What counts is the activity and the whole-hearted commitment. In such a regulatory regime meeting low standards might well attract more attention from the regulator than failing to meet high standards. While such enlightened regulatory regimes do not exist, regulators may remain a block to progress by the best.

Management Failure

Changes in top management, or management's priorities, at critical periods, may prove fatal to the successful transition to a higher safety culture. A cultural change is drastic and never takes place overnight. If a champion leaves, there is often no-one to take up the fight and the crucial top-down impetus is lost. But even without a personnel change there are two threats to the successful transition to a higher level of safety culture. One is success, the other failure. In the case of success, effective processes, tools and systems may be dropped, because the problem is perceived to have gone away. In the case of failure, old-fashioned approaches may be retrieved on the grounds that they worked before. But in both of these cases the new, and often fragile, beliefs and practices may not have become sufficiently internalised.

A common problem in organisations that are struggling on the borderline between the calculative and the proactive/generative levels is success. Once significant improvements in outcome performance have been achieved management ‘take their eyes off the ball’ and downgrade efforts on the grounds that the problems have been solved. But this is behaviour typical of the reactive stance and represents a reversion. Management have to be truly committed to the maintenance of an advanced culture in the face of success, and such commitment is rare.

Change is hard

One underlying reason why cultural change often fails to succeed is that the new situation is unknown to the participants. If this is added to existing beliefs, such as the belief that the current situation is as good as it gets, then there is little real need to change and failure is almost certain. If these failures are at the level of the workforce, then strong management commitment may save the day. If the problems lie with management, then there is little hope because they will enforce the old situation, which feels most comfortable, on the most proactive of workforces. A colleague (G. Old, Pers. Comm.) has likened this to learning a new golf swing by changing the grip and the stance. At first the new position hurts, the old grip position much more comfortable. It takes time before the benefits of a new grip and the altered stance come through, you have to trust the pro, but you have to do the work! One advantage of this metaphor is that managers often play golf and can transfer their experience of learning a new swing to learning to manage an advancing culture. Change agents are like golf professionals, they can help develop a person’s game, but they can’t play it for them.

Conclusion

The discovery that a safety culture pays is crucial. One way a safety culture pays off, as the levels of trust improve, is in the quality of communication between management, and the rest of the company. As this is always pointed to as a source of problems, having a definitive focus for improving communication can only result in improved performance at all levels. Another way a safety culture pays is in the reduction in time and paperwork devoted to checking whether elementary safety-related actions are carried out. The other main reason why safety makes money lies in the fact that, if one has a guarantee of safety, then one can devote resources more effectively. What costs money is not safety, but bad safety management. Once the management of an organisation realises that safety is financially rewarding and that the costs incurred have to be seen as investments with a positive return (Hudson & Stephens, 2000), the road to a full safety culture should be open.

Given the financial inducements, why don’t organisations try and develop the most advanced forms of safety culture? The answer seems to be contained in the type of culture the organisation is at the time. Pathological organisations just don’t care. Reactive organisations think that there is nothing better and anyone who claims better performance is probably lying. They do what they feel is as good as can be done. Calculative/Bureaucratic organisations are hard to move because they are comfortable, even if they know that improvement is possible. The more advanced cultures, either Proactive or Generative, are probably easier to attain with small organisations. Large ones will inevitably be heavily bureaucratic unless active steps are taken to counter that tendency.

References

- Furnham, A. (1997) *The Psychology of Behaviour at Work*. Psychology Press, Hove, England
- Hudson, P.T.W. (1998) European Association of Aviation Psychology. Keynote Address, Vienna
- Hudson, P.T.W. (1998) Keynote Address Singapore Aviation Academy
- Hudson P.T.W. & Stephens, D. (2000) Cost and Benefit in HSE: A Model for Calculation of Cost-benefit using Incident Potential. *Proceedings 5th SPE International Conference on Health, Safety and Environment in Oil and Gas Production and Exploration*. CD-ROM, SPE, Richardson, Texas.
- Hudson, P.T.W., Parker, D., Lawton, R., Verschuur, W.L.G., van der Graaf, G.C. & Kalff, J. (2000) The Hearts and Minds Project: Creating Intrinsic Motivation for HSE. . *Proceedings 5th SPE International*

Conference on Health, Safety and Environment in Oil and Gas Production and Exploration. CD-ROM, SPE, Richardson, Texas.

La Porte, T.R. (1996) High Reliability Organizations: Unlikely, Demanding and At Risk. *Journal of Contingencies and Crisis Management*, **4**, 60-71

La Porte, T.R. and Consolini, P.M. (1991) Working in Practice but not in Theory: Theoretical Challenges of High Reliability organizations. *Journal of Public Administration Research and Theory*, **1**, 19-47

Prochaska, K. & DiClemente C. (1995) Attitudes to Change. *The American Psychologist*.

Reason, J.T. (1997) *Managing the Risks of Organisational Accidents*. Ashgate, Aldershot.

Rousseau, D. (1988) Quantitative Assessment of Organisational Culture: The Case for Multiple Measures. In L.C. Cooper & I. Robertson (Eds). *International Review of Industrial and Organisational Psychology*. Wiley, Chichester

Sheen. Lord Justice (1987) *The Herald of Free Enterprise*. HMSO, London.

Rochlin, G.I., La Porte, T.R., and Roberts, K.H. (1987) The Self-Designing High-Reliability Organization: Aircraft Carrier Flight Operations at Sea. *Naval War College Review*, **40**, 76-90

Schein, E.H. (1992) *Organizational Culture and Leadership* (2nd Edition). Jossey-Bass, San Francisco.

Schein, E.H. (1996) Culture: The Missing Concept in Organization Studies. *Administrative Science Quarterly*, **41**, 229-240.

Turner, B.A. & Pidgeon, N.F. (1997) *Man-Made Disasters* (2nd Edition). Butterworth Heinemann, Oxford.

Weick, K.E. (1987) Organizational Culture as a Source of High Reliability. *California Management Review*, **29**, 112-127.

Weick, K.E. & Roberts, K.H. (1993) Collective Mind in Organizations: Heedful Interrelating on flight Decks. *Administrative Science Quarterly*, **38**, 357-381.

Westrum, R. (1991) Cultures with Requisite Imagination. In J.Wise, P.Stager & J.Hopkin (Eds.) *Verification and Validation in Complex Man-Machine Systems*. Springer, New York

Westrum, R. & Adamski, A.J. (1999) Organizational Factors Associated with Safety and Mission Success in Aviation Environments. In D.J.Garland, J.A. Wise & V.D.Hopkin (Eds.) *Handbook of Aviation HumanFactors*. Lawrence Erlbaum, Mahwah, NJ.