THE ROLE OF HEALTH AND SAFETY CULTURE IN CONSTRUCTION

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People are frequently cited as the most important resource in construction. Despite people being the most important resource, many construction practitioners believe that: construction is inherently dangerous; accidents are part of the job, and the goal of zero accidents and/or fatalities is impossible to achieve. Other beliefs include that H&S costs money and that the majority of accidents are attributable to unsafe acts and consequently the fault of workers.

H&S culture is at the upstream end of the upstream → downstream sequence: culture → management system → exposure → incidents, and consequently influences and plays a major role in H&S. H&S culture is comprised of values, purpose, mission, vision, goals and assumptions, which individually and collectively are pre-requisites for the optimum H&S culture. However, relative to inadequate or the lack of H&S, management and workers knowingly take risks, management 'turns a blind eye', workers work in an environment created by management, people often blame others and/or provide excuses for their actions or omissions, and incompetence is frequently the cause thereof. Conversely, management commitment is both a pre-requisite and the catalyst for H&S.

Given the aforementioned, an exploratory descriptive survey was conducted in a selected South African 'H&S best practice' general contractor (GC), cited in, inter alia, the 'Egan' Report, the objective being to assess the H&S culture. The salient findings include: generally, a healthy H&S culture exists in the GC concerned; management and supervision appreciate their influence on H&S performance, the findings reinforcing the role and importance of management commitment; generally, management and supervision believe that accidents and fatalities can be prevented, however, the mistaken belief that construction is inherently dangerous, exists, and various macro issues impact on H&S performance in a contracting organization and the industry.

Keywords: culture, health and safety, pilot study

INTRODUCTION

Ember and Ember (1993) define culture as "the learned behaviours as well as the beliefs, attitudes, values and ideals that are characteristic of a part of society or population." Culture has two defining features. First, the beliefs, attitudes, values and ideals are shared by the majority of the population. Second, they are learned. A further aspect is that they are transmitted through a spoken symbolic language. Language is symbolic in that a word or phrase can represent what it stands for, whether or not that thing is present. This symbolic quality has tremendous implications for the transmission of culture. It means that a hazardous situation can be described, the circumstances leading to it predicted, and preventative actions explained. If symbolic language did not exist, the aforementioned would not be

possible, and the actual hazardous situation would have to be used as an example, or experienced.

Given the nature and implications of culture, a study was initiated to investigate H&S culture in South African construction, the objectives being to:

- assess the prevailing H&S culture, and

- to investigate the relationship, if any, between H&S culture and H&S performance.

The first phase of the study entailed a literature survey and an exploratory descriptive survey in a selected South African 'H&S best practice' GC, the sole objective being to assess the H&S culture i.e. to determine whether the H&S culture in such an organization reflects the optimum H&S culture descried in literature.

THE IMPORTANCE OF CULTURE

Figure 1 presents the upstream $\rightarrow$ downstream sequence postulated by Krause (1993). Culture is at the upstream end, and influences management system, which influences exposure, which may or may not result in incidents at the end point of the sequence.

Culture $\rightarrow$	Management $\rightarrow$ System	Exposure $\rightarrow$	End Points
Values	Education/	Behaviour	Incidents
Purpose	Training	Conditions	
Vision	Practices	Plant and	
Goals	Programme	equipment	
Mission	Site layout	Facilities	
Assumptions	Behavioural		
	consequences		
	Priorities		
	Attitude		
	Measurement		
	system		
	Improvement		
	model		
	Resources		

Figure 1: Incidents are downstream (adapted from Krause, 1993).

Values

Values are defined as: code of behaviour, ethics, standards (moral) and principles (Allen, 1990). Values are important as they influence the vision, goals, mission, assumptions and to a degree, the perceived purpose of H&S (Krause, 1993). H&S needs to be a value, as opposed to a priority, as priorities change depending upon prevailing circumstances and priorities. An example thereof is schedule, which often becomes the priority on projects, to the detriment of H&S. If H&S is a value, then it is unlikely to be marginalized by schedule or any other current priority (Griffiths, 1995). Hinze (1997) is emphatic and says that although even a cold, calculating economist can be convinced that there is a financial payback in being healthy and safe, a holistic H&S culture recognizes the humanitarian aspects of H&S.

Purpose

According to Collins and Porras (Ray and Rinzler, 1993) purpose is what people in an organization want to contribute, in the broader sense, to all stakeholders, so that they are inspired to their highest level of performance. Although 'mitigation or elimination

of accidents, fatalities, injuries and disease' constitutes an obvious purpose of H&S, such a purpose is more a means to an end, than an end itself. The 'ultimate' purpose of H&S is 'sustainability of the organization'. Such a purpose is important for two reasons. Firstly, the synergy that exists between H&S, productivity and quality (Levitt and Samelson, 1993). Secondly, should workers not have ever been injured and, or an organization only experiences accidents infrequently, a lesser purpose will not motivate and engender optimum H&S performance.

Vision

Collins and Porras (Ray and Rinzler, 1993) describe vision as "the ability to see the potential in or necessity of opportunities right in front of you." In other words, vision is creating the future by taking action in the present. Having a vision is important, as it influences the goals, and consequently, the mission. The importance of vision is best described by Senge (1990) in his vision / current reality analogy presented in Figure 2 below. The vision may be: 'A work place free of fatalities, injuries and disease, whereas the current reality may be: 'Recurring accidents accompanied by regular incidents'. The ability to realize the vision and move away from the current reality can be likened to the elastic band extended between the 'vision' and 'current reality' hands. The status quo will be determined by which hand is moved i.e. moving 'vision' will extricate a project and, or an organization from the 'current reality', whereas perpetuating 'current reality' will compromise the achievement of the vision.
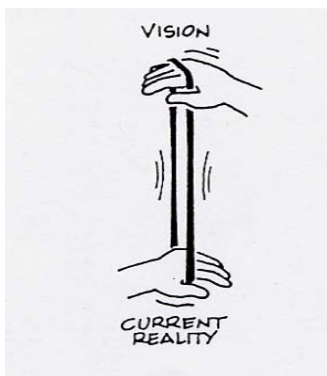

Figure 2: Creative tension (Senge, 1990).

Goals

Goals represent aspirations, serve as a common bond and as a standard of evaluation, and in many cases, organization effectiveness is defined as the extent to which the goals have been attained. Is there a relationship between vision and goals? Yes, as a vision of an 'injury-free workplace' requires a goal of 'zero accidents'! Is such a goal realistic? The Business Roundtable (1994) says: "While it is recognized that accidents do occur, this recognition should never convey acceptance that accidents must occur." 'Zero accidents' is the only realistic goal, since a lesser goal would represent compromise in that it leaves the subtle message that accidents will occur, and that they are acceptable. In essence, 'zero accidents' is a 'state of mind'.

Mission

A mission should be a clear, definable and motivational point of focus. A mission is complementary to the vision and goals. A vision of an 'injury-free workplace' and a goal of 'zero accidents' demands a mission: 'To maintain continual improvement of H&S' (Levitt and Samelson, 1993).

Assumptions

Assumptions are important, as although research or experience might indicate that increased H&S effort results in a decrease in incidents, it is not guaranteed. Therefore, unless one assumes that incidents will be minimized through H&S effort, one is unlikely to be committed, apportion the optimum resources, and consequently fail to realize the vision (Krause, 1993).

BARRIERS TO AN OPTIMUM H&S CULTURE

Hinze (1997) cites the belief that compliance with H&S regulations is costly or compromises project schedule, as a barrier to evolving an H&S culture on a project. Such a belief pits costs against H&S, and schedule against H&S.

A major barrier to the development of an optimum H&S culture is the belief that construction is inherently dangerous. This belief is fatalistic and presupposes that accidents are inevitable (Hinze, 1997). However, Levitt and Samelson (1993) maintain that the myth that accidents are inevitable is disappearing.

Hinze (1997) also questions the validity of the contention that 90% of injuries are caused by worker actions and that 10% are caused by unsafe conditions. Such a contention ignores the reality that the work environment affects the mental acuity of workers. Hinze also argues that most accidents are really a combination of physical conditions and worker actions. In essence, workers work in an environment created by management and no worker wants to be injured.

Levitt and Samelson (1993) maintain that most contractors do not have a cost accounting system that tracks the cost of accidents, which effectively marginalizes the undertaking of any cost-benefits analysis relative to H&S. The ability to prove the benefits of H&S is important, as being able to do so reinforces the assumption.

The elements of intercultural communication namely, perception, verbal and non-verbal responses all impact on H&S. Research conducted in Botswana among contracts and site managers to determine the influence of generic culture on H&S, determined the following findings: generic culture inhibits the implementation of H&S on site as a result of poor risk assessment and lack of understanding, and generic cultural background affects the keenness of workers to follow H&S procedures (Ngowi and Mothibi, 1996).

Various authors maintain management and workers knowingly take risks. Lonner and Malpass (1994) maintain cultural values affect views about risk. Avoiding uncertainty is a value, which has a direct effect on risk perception. People in cultures placing a high value on uncertainty avoidance like to have clear requirements and preferences spelled out for them. However, this preference is not universal.

PRE-REQUISITES FOR A H&S CULTURE

Hinze (1997) maintains that the key to a successful H&S programme is for it to be universally adopted within an organization such that every worker realizes that all activities are to be healthy and safe ones. Realizing a H&S culture effectively entails the amalgamation of H&S with cost control, quality assurance and scheduling, such that H&S is an integral component of every activity.

Related to universal adoption of H&S is the realization that H&S performance on a project is just as much a measure of success as are the traditional measures of cost, quality and schedule. No project on which a worker has been killed or permanently

disabled can be considered a success. The quality must be total, and total quality includes the overall H&S of every worker (Hinze, 1997).

Top management commitment to and support for H&S is essential for the realization of an optimum H&S culture. Such support and commitment manifests itself when H&S is foremost in the minds of all management, supervisors and workers. Management should not turn a blind eye, and no worker should be permitted to work in an unhealthy and unsafe manner (Hinze, 1997).

Workers should point out unhealthy and unsafe procedures being employed by fellow and other workers. In an organization with an optimum H&S culture, workers regard themselves as their 'brother's keeper'. Ultimately, the degree to which H&S is inculcated in workers, is such that workers only undertake activities in a healthy and safe manner (Hinze, 1997).

Top H&S performance must be accepted as an achievable goal to realize an optimum H&S culture. Goals must be set at a high level. If an organization sets goals at a low level they will probably attain such goals. Achieving the industry norm or marginally better is also unlikely to be of much comfort (Hinze, 1997). Zero accidents is a goal worth pursuing. Such a goal requires belief in the achievement thereof, and the USA Construction Industry Institute maintains adopting such a goal constitutes a 'significant H&S paradigm shift' accompanied by top down commitment (Hinze, 1997).

The realization that the focus on H&S must address both physical conditions and the mental environment provided or created for the worker is a further pre-requisite. Although the environment affects the mental acuity of workers and their focus on the work, workers' actions are influenced by the workers themselves, immediate supervisors, site and top management (Hinze, 1997).

Accountability of all levels of management for H&S is essential for an optimum H&S culture (Levitt and Samelson, 1993). This requires measurement of manager H&S performance, feedback and reward. Accident cost per work-hour is a recommended measure.

H&S education of managers is a pre-requisite for management commitment, which in turn is a prerequisite for an optimum H&S culture (Levitt and Samelson, 1993). Managers are unlikely to be committed to H&S if their level of knowledge and awareness is marginal or minimal. They will also not be empowered to undertake the necessary interventions and actions, or to manage H&S. Similarly, workers that are not trained will not be knowledgeable or aware, and consequently unable to recognize unsafe conditions and to undertake activities in a healthy and safe manner.

Other influences
The relevance of religion to H&S culture is indirectly, and or directly referred to by various authors. Sadeq and Ahmad (1996) maintain that the concept of the 'economic man', which entails the taking of decisions based on the calculation of the benefits relative to the costs of an intervention, may result in a decision, which is in conflict with the Islamic 'Tawhidic' principles of justice and equity, dignity of labour and removal of hardship. Inoue (1997) cites the Buddhist principle of 'enlightenment', which entails release from 'picking and choosing' – the preference for one thing over another, often at the expense of other people. From a Christian perspective, Neff (1991), maintains that emphasis on the financial 'bottom line' to measure success can result in unreasonable practices, which can result in hardship and suffering.

Generic contentions may also be relevant to H&S, and more specifically, H&S culture. Schwartz (1995) contends unsuccessful people suffer a mind-deadening thought disease called 'excusitis' – the affliction which manifests itself in the offering of excuses to explain lack of or poor performance. 'Excusitis' could perpetuate current reality, and marginalize the achievement of the vision. Peter and Hull (1996) maintain that occupational incompetence is everywhere and at all levels of every hierarchy. Such incompetence may simply preclude the realization of a H&S culture

Benefits of an optimum H&S culture
Levitt and Samelson (1993) maintain that contractors gain more than: reductions in workers' compensation and liability insurance premiums; rebates, and reductions in the indirect costs of accidents. Other benefits include enhanced morale of supervisors and workers, and increased attractiveness to clients as a result of perceived holistic quality.

RESEARCH METHODOLOGY

The literature survey reviewed the barriers to, the pre-requisites for, and the characteristics of an optimum H&S culture. Given that the study concerned was at the exploratory stage, it was decided to assess the H&S culture in a selected South African medium sized general contractor (GC) by means of a pilot study.

The GC is one of 28 GCs which have achieved placings in the Building Industries Federation South Africa (BIFSA) national H&S competition and, or BIFSA 4 or 5-Star H&S gradings on one or more of their projects for the period 1999 to 2000 i.e. South Africa's 'H&S best practice' GCs. The GC's improvement in holistic performance resulting from the implementation of total quality management (TQM) techniques incorporating, inter alia, focus on H&S interventions, is also cited in the 'Egan' report, 'Rethinking Construction' (Department of the Environment, Transport and the Regions, 1998).

All levels of management – top, middle and site, were surveyed using a written questionnaire. The primary question consisted of 29 statements.

Given that respondents were required to respond in terms of concurrence and importance to statements pertaining to H&S culture on a scale of 1 (strongly agree) to 5 (strongly disagree), it was necessary to compute an importance index (II) with a minimum value of 0, and a maximum value of 4.

However, given that five of the statements are 'negative' i.e. the optimum response would be 100% strongly disagree, as opposed to 100% strongly agree, the weightings have been reversed. The statements include: "Construction is inherently dangerous"; "Accidents are part of the job"; "Management sometimes turns a blind eye"; "Management knowingly takes risks"; and "Workers knowingly take risks."

RESEARCH FINDINGS

Twenty five responses were received. Table 1 indicates that the majority of respondents were from site management level. Table 2 presents the years of work experience in construction and in the employ of current GC. Table 3 indicates the extent to which respondents agree/disagree with the H&S culture related statements.

Table 1: Levels of management.

Level	Response	
	No.	%
Top	1	4.0
Middle	1	4.0
Site	18	72.0
Not recorded	5	20.0
Total	25	100.0

Table 2: Years of experience in construction and current GC.

Level	Construction			Current GC		
	Minimum	Maximum	Mean	Minimum	Maximum	Mean
Top	10.6	10.6	10.6	10.6	10.6	10.6
Middle	5.8	5.8	5.8	3.8	3.8	3.8
Site	2.0	36.0	17.3	2.0	11.7	5.8
Not recorded	-	-	-	-	-	-
All	2.0	36.0	16.4	2.0	11.7	5.9

It is significant that twenty six of the twenty nine II values are above the midpoint value of 2.00, which indicates that the statements can be deemed to be subscribed to by the management and supervisors. It is equally significant that fifteen of the twenty nine II values are above 3.0, which indicates that the majority of respondents strongly agree/agree with the statements.

The ranking of "People are the most important resource" first, and "Management does not want workers to be injured" second, reflects the existence of healthy values. The ranking of "Middle management (contracts managers) support is essential" third, "Top management (MD and Directors) support is essential" joint fifth, and "Management commitment is a pre-requisite for H&S" seventh, reinforces the importance of management commitment relative to H&S. Similarly, the ranking of "Workers work in an environment created by management" sixteenth, indicates acknowledgement by management and supervision of their influence and role. It is notable that a related statement "Organization H&S culture affects a person's actions relative to H&S" achieved a ranking of eleventh.

Although " Zero fatalities is achievable" and " Zero accidents is achievable" were ranked twelfth and thirteenth respectively, the ranking of " A H&S mission should be to continually improve H&S" fourth, indicates that management and supervision believe that H&S performance can be improved – which if continually realized, effectively means zero fatalities and accidents are achievable. This is reinforced by the ranking of "Workers do not want to injure themselves" joint fifth, which indicates the existence of a 'complementary culture'.

It is notable that "H&S efforts result in benefits" and " The benefits of H&S outweigh the costs thereof" were ranked eighth and tenth, ahead of "H&S costs money", ranked fifteenth. Although "H&S should by a value and not a priority, as priorities change" only achieved a ranking of thirteenth, the II value is above 3.00, which indicates the majority of respondents strongly agree/agree with the statement.

Although it can be argued that the ninth ranked "The purpose of H&S is to minimize injuries", is just that, the minimization of injuries is a means to an end, the end being sustainability – "The purpose of H&S is sustainability (continued existence) of the organization" only achieved a ranking of seventeenth.

Table 3: Extent to which respondents agree/disagree with statements
(SA = Strongly agree; A = Agree; N = Neutral; D = Disagree; SD = Strongly disagree)

Statement	Response (%)					II	Rank
	SA	A	N	D	SD		
People are the most important resource	91.7	8.3	0.0	0.0	0.0	3.92	1
Management does not want workers to be injured	83.3	16.7	0.0	0.0	0.0	3.83	2
Middle management (Contracts managers) support is essential	70.8	29.2	0.0	0.0	0.0	3.71	3
A H&S mission should be to continually improve H&S	64.0	36.0	0.0	0.0	0.0	3.64	4
Workers do not want to injure themselves	62.5	37.5	0.0	0.0	0.0	3.63	5=
Top management (MD & Directors) support is essential	62.5	37.5	0.0	0.0	0.0	3.63	5=
Management commitment is a pre-requisite for H&S	56.0	40.0	4.0	0.0	0.0	3.52	7
H&S efforts result in benefits	60.0	28.0	8.0	4.0	0.0	3.44	8
The purpose of H&S is to minimize injuries	48.0	44.0	8.0	0.0	0.0	3.40	9
The benefits of H&S outweigh the costs thereof	48.0	36.0	16.0	0.0	0.0	3.32	10
Organization H&S culture affects a person's actions relative to H&S	44.0	44.0	4.0	8.0	0.0	3.20	11
Zero fatalities is achievable	34.8	47.8	13.0	0.0	4.4	3.09	12
H&S should be a value and not a priority, as priorities change	56.5	17.4	8.7	8.7	8.7	3.04	13=
Zero accidents is achievable	20.0	68.0	8.0	4.0	0.0	3.04	13=
H&S costs money	44.0	36.0	0.0	16.0	4.0	3.00	15
Workers work in an environment created by management	16.7	58.3	25.0	0.0	0.0	2.92	16
The purpose of H&S is sustainability (continued existence) of the organization	25.0	45.8	16.7	3.3	4.2	2.79	17
A person's culture affects his/her attitude, approach and actions relative to H&S	16.7	58.2	4.2	16.7	4.2	2.67	18
'Excusitis' negatively affects H&S	39.1	13.0	21.7	26.1	0.0	2.65	19
Incompetence is frequently the cause of poor H&S	24.0	40.0	16.0	16.0	4.0	2.64	20
Accidents are part of the job	4.0	24.0	12.0	36.0	24.0	2.52	21
The practice of blaming others for acts/omissions negatively affects H&S	16.0	40.0	24.0	12.0	8.0	2.44	22
A person's personality type affects his/her attitude, approach and actions relative to H&S	12.0	40.0	24.0	24.0	0.0	2.40	23=
Developed countries are likely to perform better than developing countries	16.0	48.0	4.0	24.0	8.0	2.40	23=
Management sometimes 'turns a blind eye'	4.2	29.2	8.3	41.2	16.7	2.38	25
Management knowingly takes risks	4.2	41.2	8.3	16.7	29.2	2.25	26
Workers knowingly take risks	4.0	60.0	16.0	12.0	8.0	1.60	27
Belief in and practice of a religion positively affects a person's approach to H&S	0.0	20.0	24.0	20.0	36.0	1.28	28
Construction is inherently dangerous	32.0	52.0	4.0	12.0	0.0	0.96	29

A significant finding is the twenty ninth ranking of "Construction is inherently dangerous " – given that it is a 'negative' statement the low II value indicates that the 'belief' is subscribed to by the majority of respondents. Similarly, although "Accidents are part of the job" achieved an II of 2.52 as a 'negative' statement, 24% of respondents agreed therewith.

Although "Excusitis negatively affects H&S", "Incompetence is frequently the cause of poor H&S", and "The practice of blaming others for acts/omissions negatively affects It is significant that twenty six of the twenty nine II values are above the midpoint value of 2.00, which indicates that the statements can be deemed to be subscribed to H&S" achieved rankings of nineteenth, twentieth and twenty second respectively, their II values indicate that more than half of the respondents agreed therewith.

The II values achieved by "A person's culture affects his/her attitude, approach and actions relative to H&S" and "Developed countries are likely to perform better than developing countries", indicates that there is a macro perspective to H&S – there are certain influences which are beyond, or partially beyond the 'influence' of an employer and, or industry. Similarly the 20% 'agree' response relative to "Belief in and practice of a religion positively affects a person's approach to H&S" reinforces this contention.

It is also notable that the other 'negative' statements of "Management sometimes turns a blind eye", "Management knowingly takes risks", and "Workers knowingly take risks", in particular the latter, achieved the II values they did.

CONCLUSIONS

H&S culture influences practices, the allocation of resources and performance relative to H&S. H&S culture is primarily a function of values and the realization of the ultimate purpose of H&S. However, to realize an optimum H&S culture requires a vision, 'realistic' goals and accompanying mission, and the catalytic assumptions.

Myths such as 'construction is inherently dangerous', 'H&S and cost, quality and schedule are mutually exclusive', and 'H&S costs money', are barriers to the realization of an optimum H&S culture.

The realization that H&S is an integral part of every activity, H&S enhances performance relative to cost, quality and schedule, management commitment, education and training of management and workers, worker participation in H&S, and management creates and manages the work environment, engender the realization of an optimum H&S culture.

Although the study is in the exploratory stage, the objective was to assess the H&S culture in a 'H&S best practice' GC to determine whether the features of an optimum H&S culture are present. The pilot survey indicates that with the exception of the belief that 'construction is inherently dangerous', management and supervisors believe that they can influence H&S performance, and more importantly, that accidents and fatalities can be prevented. Overall, a 'healthy' H&S culture exists.

FURTHER RESEARCH

The first and second phases of the study will assess the H&S culture of the group of 28 'H&S best practice' GCs and investigate the relationship, if any, between H&S culture and H&S performance. The final phase of the study will be directed towards the development of guidelines for the realization of an optimum H&S culture.

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