THE INFLUENCE OF HEALTH AND SAFETY (H&S) CULTURE ON H&S PERFORMANCE

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The upstream / downstream H&S sequence: culture, management system, exposure, incidents - indicates the influence of H&S culture on H&S performance. Values, vision, goals, mission, purpose, and assumptions, which collectively constitute H&S culture, occur upstream of and sequentially influence management system, exposure and ultimately, incidents. The second phase of the study reported on in the paper investigated the extent to which beliefs / perspectives / practices positively or negatively impacted on H&S performance, the reasons for the perceived impact, and how the impact manifested itself. The sample frame consisted of 26 'H&S best practice' GCs. Salient findings include: 'positive' components of an H&S culture impact positively, while 'negative' components impact negatively on H&S performance; comments from management, measurement and personal observations, constitute the predominating reasons for the perceived impact, and the positive impact manifested itself in reduced accidents and compensation insurance claims, compensation insurance rebates, enhanced housekeeping, environment and productivity, and improved programme performance. The findings amplify the role of H&S culture in H&S performance and reinforce the postulated upstream / downstream H&S sequence.

Keywords: health and safety culture, health and safety performance.

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 majority of the population shares the beliefs, attitudes, values and ideals. 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 three – phase study was initiated to investigate H&S culture in South African construction, the objectives being to:

assess the prevailing H&S culture;

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

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determine how the relationship manifests itself.

The first phase of the study entailed a literature survey and an exploratory descriptive survey, the sole objective being to assess the H&S culture of a South African 'H&S best practice' general contractor (GC) cited in the 'Egan' Report, by surveying three levels of construction management, to determine whether the H&S culture in such an organisation reflected the optimum H&S culture described in literature. The findings of this phase, which were presented at the 17th Annual ARCOM Conference, indicated 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, it was determined that a 'healthy' H&S culture existed (Smallwood 2001).

The objectives of Phase 2 of the study are to:

investigate the extent to which beliefs / perspectives / practices positively or negatively impact on H&S performance;

the reasons for the perceived impact, and

how the impact manifested itself.

Phase 3 of the study will be directed towards the development of guidelines for the realisation of an optimum H&S culture.

LITERATURE SURVEY

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.

This sequence graphically portrays the link between H&S culture and H&S performance.

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

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

Culture is collectively comprised of values, purpose, vision, goals mission, and assumptions.

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. If H&S is a value, then it is unlikely to be marginalised 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 recognises the humanitarian aspects of H&S.

According to Collins and Porras (Ray and Rinzler 1993) purpose is what people in an organisation 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 organisation'. Such a purpose is important for two reasons. First, the synergy between H&S, productivity and quality (Levitt and Samelson 1993), and second, should workers not have ever been injured and, or an organisation only experiences accidents infrequently, a lesser purpose will not motivate and engender optimum H&S performance.

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 vision / current reality analogy of Senge (1990) enables the communication of the role of vision within the context of H&S. Although the current reality may be: 'Recurring accidents accompanied by regular incidents', a vision of 'A work place free of fatalities, injuries and disease' will be necessary to extricate a project and, or an organisation from the current reality.

Goals represent aspirations, serve as a common bond and as a standard of evaluation, and in many cases, organisation effectiveness is defined as the extent to which the goals have been attained. Vision and goals are related, as a vision of 'injury-free workplaces' requires a goal of 'zero accidents'. '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' (The Business Roundtable 1994).

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

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 it is assumed that incidents will be minimised through H&S effort, one is unlikely to be committed, apportion the optimum resources, and consequently fail to realise 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 optimum 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).

The contention that 90% of injuries are caused by worker actions, and 10% by unsafe conditions ignores the reality that the work environment affects the mental acuity of workers (Hinze 1997). 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 marginalises 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 that 'increased H&S effort will result in a decrease in incidents'.

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.

Other influences

The relevance of religion to H&S culture is alluded to by, inter alia, Sadeq and Ahmad (1996), who 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.

Generic contentions also influence culture. Schwartz (1995) contends unsuccessful people suffer a mind deadening thought disease called 'excusitis' – the affliction that manifests itself in the offering of excuses to explain lack of, or poor performance. 'Excusitis' could marginalise vision, goals and mission.

Pre-requisites for an optimum H&S culture

Hinze (1997) maintains that the key to a successful H&S programme, including an optimum H&S culture, is for it to be universally adopted within an organisation such that every worker realises that all activities are to be healthy and safe ones. This 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 realisation 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 realisation 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).

In an organisation with an optimum H&S culture, workers adopt the approach 'I am my brother's keeper', and point out unhealthy and unsafe procedures being employed by fellow and other workers (Smallwood 2001).

Top H&S performance must be accepted as an achievable goal to realise an optimum H&S culture. Goals must be set at a high level. If an organisation 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 realisation 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, and by site, middle 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 recognise unsafe conditions and to undertake activities in a healthy and safe manner.

Benefits of an optimum H&S culture

Levitt and Samelson (1993) maintain that contractors gain more than reductions in workers' compensation (WC) and liability insurance premiums, WC 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. Hinze (1997) places the role and benefits of H&S culture in perspective with the quotation: "Working on a project without establishing a strong safety culture is like holding a dead man's hand."

RESEARCH

Sample frame

The sample frame consisted of twenty-six GCs, who had achieved a first, second or third place in the Building Industries Federation South Africa (BIFSA) national Health and Safety (H&S) competition during the years 1995 to 2000 inclusive.

A questionnaire was mailed to the GCs. Ten GCs responded, which represents a response rate of 38.5%.

ANALYSIS

Given that respondents were required to respond in terms of the extent to which beliefs / perspectives / practices impact on H&S performance, it was necessary to compute an importance index (II) with a minimum value of 0, and a maximum value of 4, to determine whether the impact is positive or negative, the extent thereof, and to rank the various beliefs / perspectives / practices based upon the extent of the impact. The II is calculated using the formula:

$$\frac{4n_1 + 3n_2 + 2n_3 + 1n_4 + 0n_5}{(n_1 + n_2 + n_3 + n_4 + n_5)}$$

Where: $n_1 =$ Positive
$n_2 =$ Near positive
$n_3 =$ Neutral
$n_4 =$ Near negative
$n_5 =$ Negative

Findings

Table 1 indicates the nature and extent of the impact of thirty beliefs / perspectives / practices on H&S performance. It is significant that the II values of twenty-four of the thirty, are above the midpoint value of 2.0, which indicates that the beliefs / perspectives / practices can be deemed to have a positive effect on H&S performance. It is also significant that the II values of the top eleven ranked beliefs / perspectives / practices are 3.20, which indicates that they have mainly a positive, or near positive to positive effect on H&S performance. With the exception of the belief that "The primary purpose of H&S is the prevention of fatalities, injuries and disease", it is significant that the importance of the top eight ranked and predominating beliefs / perspectives are stressed in literature: the value: "People are our most important resource"; a mission: "To continually improve H&S"; the belief: "Zero fatalities is achievable"; the belief: "The risks in construction can be managed"; a vision of: "An accident-free project"; the belief: "Zero accidents is achievable", and a goal of: "Zero accidents."

Given that the II values of the beliefs / perspectives / practices ranked from 12th to 24th are 2.40 < 3.20, they can be deemed to have mainly a near positive, or neutral to near positive effect on H&S performance.

It is significant that all the 'negative' beliefs / perspectives / practices have II values below the midpoint value of 2.0, which indicates that they have a negative effect on H&S performance. These include:

- management sometimes 'turns a blind eye';

- 'excusitis'; the practice of blaming others for acts / omissions; workers knowingly take risks;

- the belief: "Accidents are part of the job", and "management knowingly takes risks".

Given that these II values are between 0.80 and 1.60, they can be deemed to have mainly a near negative, or neutral to near negative effect on H&S performance.

Table 1: Nature and extent of the perceived impact of various beliefs / perspectives / practices on H&S performance

Belief / Perspective / Practice	Positively……………Negatively					Unsure	II	Rank
	1	2	3	4	5			
The value: "People are our most important resource."	80.0	20.0	0.0	0.0	0.0	0.0	3.80	1=
A mission of: "To continually improve H&S."	80.0	20.0	0.0	0.0	0.0	0.0	3.80	1=
The belief: "Zero fatalities is achievable."	70.0	30.0	0.0	0.0	0.0	0.0	3.70	3=
The belief: "The risks in construction can be managed."	70.0	30.0	0.0	0.0	0.0	0.0	3.70	3=
A vision of: "An accident-free project".	60.0	40.0	0.0	0.0	0.0	0.0	3.60	5=
The belief: "Zero accidents is achievable."	60.0	40.0	0.0	0.0	0.0	0.0	3.60	5=
A goal of: "Zero accidents."	60.0	40.0	0.0	0.0	0.0	0.0	3.60	5=
"The primary purpose of H&S is the prevention of fatalities, injuries and disease."	60.0	40.0	0.0	0.0	0.0	0.0	3.60	5=
The belief: "Optimum H&S complements overall performance."	40.0	60.0	0.0	0.0	0.0	0.0	3.40	9
The belief: "H&S efforts result in benefits."	40.0	50.0	10.0	0.0	0.0	0.0	3.30	10
The assumption: "Allocating resources to H&S will benefit H&S."	40.0	40.0	20.0	0.0	0.0	0.0	3.20	11
The belief: "Construction is inherently dangerous."	30.0	40.0	30.0	0.0	0.0	0.0	3.00	12=
The belief: "Construction is inherently dangerous."	20.0	60.0	20.0	0.0	0.0	0.0	3.00	12=
Workers actively participate in H&S.	40.0	40.0	10.0	0.0	10.0	0.0	3.00	12=
Top management focuses on H&S.	20.0	70.0	0.0	0.0	10.0	0.0	2.90	15=
Middle management 'drives' H&S efforts.	10.0	70.0	20.0	0.0	0.0	0.0	2.90	15=
The perspective: "I am my brother's keeper."	30.0	30.0	40.0	0.0	0.0	0.0	2.90	15=
Evaluation of project performance includes H&S.	30.0	40.0	20.0	0.0	10.0	0.0	2.80	18
"The primary purpose of H&S is the sustainability of the organisation."	10.0	50.0	40.0	0.0	0.0	0.0	2.70	19=
Site management stresses H&S relative to all activities.	20.0	50.0	20.0	0.0	10.0	0.0	2.70	19=
Belief in and practice of a religion.	20.0	30.0	40.0	10.0	0.0	0.0	2.60	21
The perspective: "H&S is a value and not a priority, as priorities change."	30.0	20.0	20.0	30.0	0.0	0.0	2.50	22=
The belief: "The benefits of H&S exceed the costs thereof."	20.0	50.0	10.0	0.0	20.0	0.0	2.50	22=
The perspective: "Workers work in an environment created by management."	10.0	30.0	30.0	10.0	10.0	10.0	2.22	24
Management sometimes 'turns a blind eye'.	10.0	20.0	20.0	20.0	30.0	0.0	1.60	25
'Excusitis'*	0.0	20.0	30.0	20.0	20.0	10.0	1.56	26
The practice of blaming others for acts / omissions	0.0	10.0	30.0	20.0	30.0	10.0	1.22	27
Workers knowingly take risks.	0.0	10.0	30.0	30.0	30.0	0.0	1.20	28
The belief: "Accidents are part of the job."	0.0	10.0	20.0	40.0	30.0	0.0	1.10	29=
Management knowingly takes risks.	0.0	10.0	20.0	40.0	30.0	0.0	1.10	29=

Table 2 indicates that 'comments from management' (70%) predominates in terms of reasons for the perceived impact of the beliefs / perspectives / practices on H&S performance. This level of response is significant, in that it: reflects a realisation of the significance of H&S culture; substantiates the role of H&S culture, and indicates the likelihood of an existing H&S culture being further reinforced. However, nearly the majority of GCs identified measurement, and personal observations. It is notable that 40% of GCs cited comments from workers.

Table 2: Reasons for the perceived impact

Reason	Yes response (%)
Comments from management	70.0
Measurement	60.0
Personal observations	60.0
Comments from workers	40.0
Work environment / climate	30.0
Phenomena	10.0

The minority of GCs calculated the various statistics (Table 3). It is notable that more GCs calculated the indirect cost of accidents, than the 'traditional' disabling injury incidence rate (DIIR), and the claims ratio.

Table 3: H&S statistics calculated by GCs

Statistic	Yes response (%)
Fatality rate / 100 000	30.0
Indirect cost of accidents	30.0
DIIR	10.0
Claims ratio	10.0

Table 4 indicates that reduced accidents, reduced compensation insurance claims, enhanced housekeeping, compensation insurance rebates, and improved programme performance, predominate in terms of the manifestation of the positive impact of beliefs / perspectives / practices on H&S performance. It is significant that the first two ranked manifestations are humanitarian and financial, followed by a 'work environment', financial and then synergistic manifestation.

Table 4: Manifestation of the positive impact on H&S performance

Manifestation	Yes response (%)
Reduced accidents	90.0
Reduced compensation insurance claims	90.0
Enhanced housekeeping	80.0
Compensation insurance rebates	70.0
Improved programme performance	70.0
Enhanced productivity	60.0
Reduced cost of accidents	60.0
Enhanced environment	40.0
Enhanced quality	30.0
Less rework	30.0
Less complications	10.0

A near-majority of GCs identified enhanced productivity and reduced cost of accidents.

Table 5 indicates that poor house keeping, and decline in productivity predominate in terms of the manifestation of the negative impact of beliefs / perspectives / practices on H&S performance, followed relatively closely by programme delay, and increased cost of accidents. It is notable that the second and third ranked manifestations are not H&S related, which reflects the synergy between H&S and other project parameters.

It is also notable that increased cost of accidents achieved a higher ranking than increased accidents.

Table 5: Manifestation of the negative impact on H&S performance

Manifestation	Yes response (%)
Poor house keeping	50.0
Decline in productivity	50.0
Programme delay	40.0
Increased cost of accidents	40.0
Increased accidents	30.0
Increased compensation insurance claims	30.0
Compensation insurance loading	30.0
Harm to the environment	30.0
Rework	30.0
Non-achievement of quality	20.0
Complications	20.0

CONCLUSIONS

Literature indicates that culture occurs upstream of management system, exposure and the end of the upstream → downstream sequence, incidents. This postulation is reinforced by the findings of the descriptive survey, which indicate that 'positive' components of an H&S culture have a substantial positive impact on H&S performance. Conversely, 'negative' components of an H&S culture have a negative impact on H&S performance. The reasons for the perceived impact are more qualitative than quantitative orientated, which could imply that it is not always easy to quantify the benefits of an optimum H&S culture, and of allocating resources to H&S. It also reinforces the need to make the assumption that 'allocating resources to H&S will benefit H&S'.

Humanitarian and financial benefits predominate in terms of the manifestation of the positive impact of H&S culture on H&S performance. However, synergistic benefits, such as improved programme performance and enhanced productivity, feature prominently. These holistic benefits negate the perspective that 'H&S costs money'.

Although legislation has not been specifically addressed, it is of relevance to H&S culture in that employers are required to have a policy, which should encapsulate the various constituents of culture. Further relevance to culture is that from a moral and ethical perspective it is proper to comply with legislation. However, legislation is more relevant to management system, as it provides a template in terms of what actions and interventions are required of employers. Given that culture occurs upstream of management system, that legislation reflects the minimum requirements, and the postulation that 'H&S cannot be inspected into the work place', then in terms of H&S performance, H&S culture is of greater importance than legislation.

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