

**HEALTH AND SAFETY (H&S) AWARENESS AND  
IMPLEMENTATION IN BOTSWANA'S CONSTRUCTION  
INDUSTRY**

**Innocent Musonda<sup>1</sup> and John Smallwood<sup>2</sup>**

Department of Construction Management, University of Johannesburg<sup>1</sup>  
P.O. Box 524, Auckland park 2006, Johannesburg, South Africa  
Tel:+27(0)11 406 2911  
[innocentmusonda@yahoo.co.uk](mailto:innocentmusonda@yahoo.co.uk)

Department of Construction Management, Nelson Mandela Metropolitan  
University<sup>2</sup>, PO Box 77000, Port Elizabeth, 6031, South Africa  
Tel: +27 (0) 41 504 2790, Fax: + 27 (0) 41 504 2345  
E-mail: john.smallwood@nmmu.ac.za

**ABSTRACT**

A study was conducted to determine the level of awareness and implementation of health and safety (H&S) in Botswana's construction industry. Findings from the research reveal that the level of H&S awareness is low, H&S legislation is not complied with, the management of contractors is not committed to H&S implementation, there is a lack of H&S management systems, procedures, and protocol, and clients and designers do not participate in the implementation of H&S.

Recommendations include that the requisite H&S legislation and regulations be promulgated in accordance with the International Labour Office (ILO) recommendations, and that all stakeholders should be equally responsible for the implementation of H&S.

**Keywords:** Awareness, Botswana, construction, health and safety, implementation.

## **INTRODUCTION**

An observation of many construction sites in Botswana indicated that H&S tenets such as use of personal protective equipment, protection against fall, site safety audits, meetings on site safety etc were not observed by most building contractors. Furthermore, most building construction project meetings attended by the lead researcher did not include H&S as a major agenda item which is an indication of lack of commitment to site safety. Records of the Factories Inspectorate of the Department of Labour revealed that between 2000 and 2003, more than five fatalities were recorded in Botswana's construction industry. Small as the figure might be in comparison to other nations and or in relation to what ever man-hours, it is important to appreciate that any loss of life as a result of an industrial accident is retrogressive in terms of human development, and therefore is unacceptable. The fatalities themselves are a source of concern for the current state of H&S in the construction industry. As Petersen (1996) explains, an unsafe act, an unsafe condition, and an accident are all symptoms that something is wrong in the entire management system.

The above observation, accidents and fatalities motivated this study.

The objective of the study reported on in this paper is to evaluate the level of awareness and implementation of H&S in Botswana's construction industry, based upon surveys and observations.

Results from the study provide some insights into the current H&S awareness and implementation and should be viewed in the context of an effort to improve H&S in Botswana's construction industry.

## **REVIEW OF THE LITERATURE**

### **H&S awareness**

The term 'aware' is defined as 'the state of having knowledge of somebody or something.' Knowledge is defined as the facts, information, understanding, and skills that a person has acquired through experience or education (Oxford Advanced Learner's Dictionary, 1995). Likewise H&S awareness can be defined as the state of having knowledge of the risks, hazards, and consequences associated with the construction site. According to Krause (1997), evidence of H&S-oriented artefacts, values, and assumptions indicates the adequacy of H&S implementation. Therefore it can be argued that knowledge is also an indicator of the level of awareness because artefacts, values, and assumptions are influenced by the knowledge that the organisation and workers have of H&S. H&S awareness is an antecedent of displays of behaviour, with accidents and incidents being the consequences of behaviour in the industry. That is why statistics of accidents, injuries, and / or incidents alone as a measure of the level of awareness is misleading and is not sufficient to determine the status quo. In general, determining the H&S culture in the construction industry should be the focus of H&S awareness endeavours (Krause, 1997). An example of the

importance of behavioural analysis is seen in the way in which organisations post proclamations, vision and mission statements, or even artefacts, such as warning signs concerning H&S, but do not actually ‘walk the talk’ in the sense that the unsafe behaviour, values, and assumptions that are observed, do not reflect the proclamations.

Behavioural analysis is reliable in determining the level of H&S awareness because accidents in the construction industry depend on various factors, such as the number of projects being undertaken. This is more so because a reduced number of accidents, or the total lack thereof, does not necessarily imply that an optimum H&S culture exists (Krause 1997).

The level of H&S awareness in the construction industry has impacted negatively on the implementation of H&S, in that it determines the behaviour of individuals and organisations. In fact, the behaviour of management concerning H&S, that is, the way management manages in relation to H&S, to a greater or lesser extent influences the workforce’s behaviour (Smallwood, 1996). Krause (1997) also points out that this issue of at-risk behaviour is part of the managerial system that is either implicitly encouraged or condoned by management.

### **Barriers to H&S implementation – the socio-economic environment**

Economic and labour-market policies have compounded the H&S related problems in the industry. Most of these policies have encouraged insecurity

at work. Workers are often prohibited from complaining about conditions and employers face diminished incentives to invest in newer and appropriate safer methods of work (Daykin, 1999). Because of this, it is difficult to rally employees and employers alike to act and behave safely, or contribute to the identification of hazardous conditions and substances at the place of work. According to observations made by Smallwood (2004), market conditions in South Africa and, indeed, in many parts of the world are such that contractors frequently find themselves in an unfair position in that, should they make the requisite allowances for H&S, they run the risk of losing a tender or negotiations to a competitor that is less committed to H&S. Authors such as Loosemore, Lingard and Walker (1999) and Ngowi and Mselle (1999) agree that contractors gain little competitive advantage from a good H&S record. An incentive exists for contractors to keep their prices very low in order to obtain work. Therefore, it could be argued that since H&S is rarely considered in the award of contracts, this in itself constitutes a barrier to the implementation of H&S in the construction industry.

Workers are the worst affected by a prevailing economic situation, since they are mostly not involved in decision-making. Workers are seen to be at the mercy of their employers. According to Kabiaru (2002), the perception that workers have of risk is reflected in the way they make a decision. He argues that this is usually based on a subjective risk assessment, that is, the probability and severity of the potential injury. This is then compared to the possibility of losing a job and, ultimately, the loss of income if they refuse to

undertake a particular task that is perceived to be risky. His conclusion is that the economy impacts negatively on the improvement of H&S because everybody wishes to survive, one way or the other.

Maloney and Smith (1999) argue that workers focus more on job security and that management focuses more on performance. In support of this, observations made by Oliver, Cheyne, Tomas, and Cox (2002), could be said to be true. Their argument is that there are mainly two fundamental causes of occupational accidents. These are the characteristics of the work and the organisational environments as well as the psychological and behavioural characteristics of the individuals. Both are highly influenced by the focus that workers and management put on job security and performance.

According to Smallwood (2004), clients have to accept that there is an H&S premium to pay in the cost of construction. To date, few clients have explicit policies for the financing of H&S in construction. In as much as contractors are being asked to raise their level of commitment, clients, as well, must be seen to be more committed. A study conducted by Smallwood (2004) revealed that most project managers in South Africa indicated that H&S will be enhanced if the client provides a sum for it, both to remove H&S from the competition between bidding organisations and, obviously, as a way in which the client can contribute. Clients are not investing as much in H&S as contracting organisations are being required to do, and this, as stated earlier, can be cited as one of the barriers to H&S implementation.

### **Stakeholder participation**

In order to meet basic health needs on construction sites, it is imperative that all participants cooperate. Management and workers, designers and clients all need to be alert to potential H&S risks (Gould and Joyce, 2002). The industry as a whole, rather than separate entities needs to collectively strive for the successful implementation of H&S. A multi-stakeholder approach is advocated by many researchers *inter alia*, Rwelamila and Smallwood (1999), who maintain that the project manager should understand that H&S, is not only the responsibility of the contractor, but of designers and all project stakeholders. Coble and Haupt (1999) also rightly point out that the way to address poor H&S performance in construction is to require cooperation at all levels and in all forms. However, this requires the combination of limited resources with a shared resolve and purpose.

Stakeholder participation calls for a wider participation from all parties. The responsibility of ensuring that H&S is implemented rests with every one, starting with the government and the people that actually initiate projects. Coble and Haupt (1999) maintain that H&S implementation must also be accompanied by commitment from all construction project clients, all levels of management, and a reciprocal commitment by construction workers.



## **RESEARCH**

The quantitative study aimed at determining the underlying construct regarding awareness and the implementation of H&S was initiated. The survey instrument needed to be designed so as to capture people's actions and perceptions. It also needed to be designed to enable an understanding of the practices in organisations relative to the study of awareness and implementation of H&S. Because of the type of data that was obtained, it was found that interviews with supervisory staff on construction sites, coupled with physical observations, constituted the best method.

Questionnaires were developed and delivered to building construction sites and respondents were requested to complete them. Checklists were also used to collect information obtained from observations. Lists of behaviours, artefacts, or elements were recorded on the checklists to validate the authenticity of the questionnaire responses i.e. if the items were found to be present, exhibited, or true. This methodology was adopted to optimise the reliability of the findings in terms of reconciling physical observations by the lead researcher with those emanating from the respondents.

The selection of the sample stratum was based on the following:

- Number of building contractors that were currently undertaking projects in Gaborone, and
- Limitations of time and financial resources.

As there were 47 active building construction sites within Gaborone during the research period, a sample of 40 contractors was realised. Some contractors had more than one site. 40 questionnaires were distributed to building contractors. 25 questionnaires were completed and included in the analysis of the data, which equates to a response rate of 62.5% (Table 1).

**Table 1:** Response rates per contractor category.

<b>Category</b>	<b>Value (000 Pound) (registered to contract for max of)</b>	<b>Questionnaires distributed (No.)</b>	<b>Response (No.)</b>	<b>Response rate (%)</b>
OC	< 50	5	1	20.0
A	> 50 < 1 00	8	3	37.5
B	> 1 00 < 4 00	8	8	100.0
C	> 4 00 < 10 00	8	6	75.0
D & E	> 10 00	11	7	63.6
Total		40	25	62.5

## **FINDINGS**

### **H&S awareness**

Findings from physical observations on construction sites lead to the conclusion that the level of awareness is low. Observations indicated that on 69.6% of sites, slightly less than half of the workers were wearing hard hats. On 96% of the sites, workers were not wearing eye protection while working with power tools. On 91.3% of the sites, workers were not wearing the requisite gloves while carrying sharp tools or materials. On a similar percentage of sites, scaffolding without guardrails or toe boards was observed. These observations provided an indication of the level of H&S awareness in the industry.

The level of awareness can also be gauged based upon the audits and inspections that are conducted by contractors, clients, and designers. 32% of the respondents said that their management conducted inspections. As inspections are part of procedures, policies, and programs, the 28% affirmative response to procedures, and 20% affirmative response relative to H&S policies are inconsistent with the response relative to inspections. If inspections are undertaken at all, why is it that the physical observations indicate that management inspections are virtually non-existent (Table 2). As noted earlier on, 91.3% of the 40 sites, slightly less than half of the workers were wearing hard hats whilst working in areas requiring them to do so, and almost all of the 40 sites had no protection against persons and objects falling from heights. 96% of the sites had workers working with power tools without guarding. This is deemed to be a contradiction and it can be concluded that inspections are generally not undertaken.

**Table 2** Frequency of audits and inspections by all stakeholders.

Entity	Response (%)				
	Never	Rarely	Sometimes	Often	Always
Contractor top management	40.0	36.0	0.0	20.0	4.0
Client	56.0	28.0	8.0	8.0	0.0
Supervising consultants	52.0	20.0	16.0	12.0	0.0
Factories Inspector	56.0	32.0	8.0	4.0	0.0
Civil organisations	84.0	4.0	8.0	4.0	0.0

Similarly, the purpose for the conducting of audits and inspections in an H&S-aware environment is to observe and record risk-taking behaviour on construction sites, and to use it to mitigate or prevent future occurrences. However, only 16% of the respondents stated that their organisations

observed and recorded risk-taking behaviour on construction sites (Table 3). This further reinforces the conclusion that the level of H&S awareness is low. Essentially, endeavours to prevent accidents, incidents, and occupational diseases are not taken.

**Table 3** Recording of risky behaviours on sites.

<b>Response</b>	<b>(%)</b>
Yes	16.0
No	68.0
Unsure	4.0
No response	12.0
Total	100.0

### **Implementation of legislation**

The implementation of H&S entails implementing the requirements of legislation, namely standards as well as systems, procedures, and protocol. 32% of the respondents indicated that their organisations were registered with the Department of Labour, and 44% of the respondents were unsure. This response can possibly be attributed to the fact that the respondents were line managers based on sites and some of them probably did not have access to information at top management level. However, legislation requires that a copy of the registration certificate be retained in a file on site. Therefore, the expected response should only have been 'Yes' or 'No'. The 44% of respondents that were not sure could then be considered to not have registered with the Department of Labour. Otherwise, respondents genuinely were not sure of the status of their organisations' registration. Therefore, it

can be concluded that legislation is not adequately implemented. The reporting of serious injuries as required by law further reinforces the conclusion that H&S legislation is not implemented. When asked whether serious injuries that caused workers to be absent from work for at least three days had occurred on their sites, 48% of the respondents responded in the affirmative. However, findings indicate that only 16.7% of the 48% said that they had reported these cases to the Department of Labour. This is yet a further indication that H&S is not being implemented. With respect to the retaining of a copy of the Factories Act on site, 52% of respondents said 'Yes', 23% 'No' and 16% were 'Unsure'. Of the 52% that said 'Yes', only 23% indicated that they had displayed a copy of the Factories Act in a prominent place on site. However, physical observations revealed that only one contractor, representing about 2.5% of the 40 sites, had displayed the Act. This indicates untruthfulness on the part of respondents even though it was clear that the Act was not displayed on sites. However, the 23% response is an indication of what the general practices in construction are. Results of the physical investigations conducted reveal that all health, safety, and welfare provisions of the Act are not adhered to.

The Factories Inspectorate rarely or never conducted inspections. 80% of the respondents said that, despite the requirement of the Act, the Inspector of Factories had never visited their construction sites. In fact, this is consistent with the percentages relative to rarely or never conducted inspections, which equates to 88% when the percentages for those responding rarely and never

are combined. These results confirm that H&S legislation is not being implemented by the Factories Inspectorate.

From a management perspective, it would appear that there is limited effort relative to the implementation of H&S. Protocol relative to the implementation of H&S appears to be non-existent. From the contractor's perspective, H&S policies, programs, meetings, procedures, H&S Representatives, and documented work procedures are almost non-existent (Table 4). In terms of the mean, 19.3% of respondents stated that they had H&S policies, programs, meetings, representatives, and documented work procedures, 62.7% stated that they did not have, and 15% did not respond to the question. It is argued that if the aforementioned existed or took place, all employees would be aware thereof. In essence, it could be argued that the mean 15% 'No' response equates to non-existence and non-occurrence. However, if they genuinely were unsure, then it can be concluded that certain documents were available, but had not been communicated and used, and that there is a general problem in terms of communication from management. Literature informs that without protocol or a system of rules governing the implementation of H&S, it is unlikely that efforts directed towards the implementation of H&S will be successful. These results further confirm that H&S legislation is not being implemented, in this case, by contractors.

**Table 4** Existence of H&S programme elements.

Element	Response (%)			
	Yes	No	Unsure	No response
H&S policy	20.0	64.0	4.0	12.0
H&S procedures	28.0	60.0	0.0	12.0
H&S programs	4.0	64.0	8.0	24.0
H&S meeting	20.0	64.0	0.0	16.0
H&S Representatives	12.0	68.0	4.0	16.0
Documented work procedures	32.0	56.0	0.0	12.0
Mean	19.3	62.7	2.6	15.0

## DISCUSSION

Literature informs that the level of awareness can be established by determining the organisational culture. This is seen through both workers' and managements' actions. Appropriate actions or behaviour will be exhibited if workers and management have knowledge of H&S standards, causes of accidents, and legislation.

However, the physical observations indicate that H&S standards are low. Literature informs that one of the major contributory factors of accidents is lack of knowledge. This finding was confirmed through observations on sites - the workers' level of awareness and that of management was low.

Literature also informs that management systems, procedures, and protocol are essential to the implementation of H&S. The findings indicate that there are a lack of management systems, procedures, and protocol in the construction industry. Hazard identification and risk assessment, prior planning, and record keeping were found to be inadequate in some

organisations while in others they were completely non-existent. This suggests that shortcomings in management systems, procedures, and protocol contribute to the current H&S performance.

As regards the extent to which clients and designers participate in the implementation of H&S on construction sites, findings are that participation by clients and designers is low. This is based upon the number of H&S audits and inspections, the lack of emphasis on H&S during client progress meetings, prior planning, and the inadequate allowance for H&S in contract documentation. The findings indicate that client and designer driven audits and inspections are limited and then inconsistent if conducted - either sometimes or rarely.

Overall findings on the study of the awareness and implementation of H&S in Botswana's construction industry reveal that the level of H&S is low and that the implementation of H&S standards is low.

## **CONCLUSIONS**

Relative to the level of H&S awareness and implementation of H&S in Botswana's construction industry, it can be concluded that:

- the level of H&S awareness is low;
- the implementation of H&S is inadequate;
- the implementation of legislation is inadequate;



- non-contractor stakeholders in the form of clients and designers are not committed to the implementation of H&S;
- accidents have occurred and risk-taking behaviour is prevalent;
- the degree of contractors' management commitment is inadequate;
- H&S management systems do not exist in many organisations, and
- H&S procedures and protocol are inadequate for the implementation of H&S.

Although the survey was conducted in Gaborone, the capital city of Botswana, the above findings can be generalised to be representative of the situation in the Country due to the following:

- In Botswana there are only two major cities namely Gaborone and Francistown;
- With the exception of mining areas which this survey did not cover, the rest of the areas are classified as villages. There is very little construction activity that is going on in these areas;
- Gaborone has a population of more than half of the entire nation's population and therefore much of business is undertaken there;
- Most Government institutions and industries are located in Gaborone, and,
- Therefore the argument is that it is not possible that H&S would be enforced in the villages when it is clear that it is not being enforced in the city where most regulatory bodies are based.

## **RECOMMENDATIONS**

Literature informs that the level of awareness needs to be increased relative to contractor employers and employees, clients and designers, and, indeed, for all stakeholders in order for the impact of H&S on construction to be appreciated. Literature also indicates that the right management systems, procedures and protocol, optimum management commitment, client and designer commitment and collaboration, and appropriate legislation need to be in place.

Therefore, to improve upon the current H&S status, the aforementioned need to be realised. Relevant legislation and regulations, which address all areas, including client and designer responsibilities, should be promulgated in accordance with ILO recommendations. Appropriate guidelines should be published as a supplement to such legislation and regulations. Currently, the implementation of H&S is the sole responsibility of the contractor and stakeholders generally do not care whether they are complying with legislation or not. Respondents in this study strongly agreed that clients, designers, and contractors should take equal responsibility for the implementation of H&S in the construction industry.

The socio-economic aspect should also be considered. In this study, respondents again indicated that financial provision for H&S would greatly contribute to the improvement of H&S implementation. Many contractors currently face diminished incentives to allow for H&S in their tenders.

It is also recommended that contracts should address H&S just as they do quality and cost. This will help many contractors, as both contractors and designers will be required to address H&S during the execution of projects. Botswana's construction industry is highly populated with small and medium size contractors, which, in most cases, have no or limited capacity to address H&S. Management systems and procedures may be too much to expect from them. Therefore, it is recommended that clients appoint H&S consultants to ensure the implementation of H&S by integrating the activities of clients, designers, and contractors. It is further recommended that collaboration between the Department of Labour, clients, designers, and contractors be promoted to engender an integrated collective H&S effort, particularly relative to small and especially emerging contractors who currently may lack the requisite H&S expertise.

## **REFERENCES**

- Coble, R. J. and Haupt, T. C. (1999) Construction safety in developing countries. *In: Singh A, Hinze J H and Coble R J (Eds.) Implementation of Safety and Health on construction sites.* Rotterdam: A.A. Balkema.
- Daykin, N. and Doyal, L. (1999) *Health and work critical perspectives.* New York: Macmillan.
- Gould, F. E. and Joyce, N. E. (2002) *Construction management- professional edition.* London: Prentice Hall.

Halpin, D. W. and Woodhead, R. W. (1998) *Construction management*. New York: John Wiley & Sons.

Kabiaru, M. A. (2002) *Occupational hazards at Murray and Roberts construction sites in Gaborone, Botswana and their effect on productivity*. Unpublished MBA Dissertation. DeMonte University.

Krause, T. R. (1997) *The behaviour based safety process*. 2<sup>nd</sup> ed. New York: Van Nostrand Reinhold.

Loosemore, M., Lingard, H., Walker, D. H. T., and Mackenzie, J. (1999). Benchmarking safety management systems in contracting organisations against best practice in other Industries. *In: Singh A, Hinze J H and Coble R J (Eds.) Implementation of Safety and Health on construction sites*. Rotterdam: A.A. Balkema.

Maloney, W. F. and Smith, G. R. (1999) A behaviour-based approach to construction: Applied behaviour analysis for construction safety. *In: Singh A, Hinze J H and Coble R J (Eds.) Implementation of Safety and Health on construction sites*. Rotterdam: A.A. Balkema.

Ngowi, A. B. and Mselle, P. C. (1999) Barriers to using environmental, safety and health record as a competitive advantage in the construction industry. *In: Singh A, Hinze J H and Coble R J (Eds.) Implementation of Safety and Health on construction sites*. Rotterdam: A.A. Balkema.

Petersen, D. (1996) *Analysing safety system effectiveness* 3<sup>rd</sup> ed. New York: Van Nostrand Reinhold.

Rwelamila, P. D. and Smallwood, J. J. (1999) Appropriate project procurement systems for hybrid TQM. *In: Singh A, Hinze J H, and Coble R J (Eds.) Implementation of Safety and Health on construction sites.* Rotterdam: A.A. Balkema.

Smallwood, J. J. (2004). *The influence of engineering designers on health and safety during construction.* Journal of the South African Institution of Civil Engineering, 46(1), pp. 2-8.

Smallwood, J. J. (1996) Influence of designers on occupational health and safety. *In: Alves Dias L.M. & Coble R.J. (Eds.) Implementation of safety and health on construction sites.* Rotterdam: A.A. Balkema.