SELECTING AND USING THE CORRECT COMMUNICATION METHOD DURING CONSTRUCTION-SAFETY PROCESSES TO ENSURE OPTIMAL PERFORMANCE

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A research report submitted to the Faculty of Engineering and the Built Environment, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Science in Building.

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DECLARATION

I declare that this research report is my own unaided work. It is being submitted to the Degree of Master of Science in Building to the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination to any other University.

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(Signature of Teboho Mpho Selatile)

…… day of …….. year …….

ABSTRACT

Johannesburg's construction sites provide a vast integration of cultural groups represented by different religions, languages, varying ages, experience and ability. Communication on these sites has proven significantly difficult. The construction industry is notorious for having one of the worst safety records amongst industries worldwide, partly attributable to breakdown in communication. This research report constructs a communication model across phases of construction with the aim of reducing accident rates and improving site health and safety.

The Case Study method formed the bulk of the methodology. Three construction companies were studied with the focus being placed on their communicative approaches to safety management. Some of the findings included the following: safety officers were fully aware of the magnitude of their role on site, however, without the support of management, these officers felt overwhelmed and ineffective; company managers felt that safety management was a non-value adding item thus its importance was not stressed; training was largely controlled by the human-resources department, which was oftentimes not site based. On the labour-front, labourers were not aware of their company's safety policies. Furthermore, labourers were largely semi-literate, however, felt the use of indigenous languages in safety management would be useful. These findings assisted in formulating a communication model applicable to most companies. The companies used similar yet different approaches concerning training, proactive management, across-the-board communication and creative signage innovations in order to rectify the breakdown. Resolving communication breakdown contributes to the successful delivery of construction projects.

DEDICATION

This research is dedicated to my mother, Bernice Selatile, who has been consistent in her guidance and support in producing this report.

The report is also dedicated to close friends who have been with me throughout the struggle. There is no worth to the level of gratitude I have for all your effort and encouragement. Thank you.

Philippians 2:2

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LIST OF ABBREVIATIONS

BBBEEA	Broad-Based Black Economic Empowerment Act of 2003
BCEA	Basic Conditions of Employment Act of 1997
COIDA	Compensation for Occupational Injuries and Diseases Act of 1993
EEA	Employment Equity Act of 1998
FEM	Federated Employers' Mutual Assurance Company Ltd
FIDIC	Fédération Internationale Des Ingénieurs-Conseils
H&S	Health and Safety
HIRA	Hazard Identification and Risk Assessment
JBCC	Joint Building Contracts Committee
LRA	Labour Relations Act of 1995
M&D	Murray and Dickson (the Construction division)
MHSA	Mine Health and Safety Act of 1997
NEC 3	New Engineering Contract: Engineering and Construction Contract
NEMA	National Environmental Management Act of 1998
NCR	Non-conformance report
ODMWA	Occupational Diseases in Mines and Works Act of 1973
OHS	Occupational Health and Safety
OHSA	Occupational Health and Safety Act of 1993
PPE	Personal Protective Equipment
SHE Rep	Safety, Health and Environmental Representative
Tyris	Tyris Construction
WBHO	Wilson Bayly Holmes-Ovcon (the Building Construction division)

CHAPTER 1 - INTRODUCTION

1.1 Background

The image of the construction industry is not a positive one, with particular reference to safety and wellbeing, nor has it had a positive image in more recent years, (CIDB, 2010). There has been increased media coverage over the past few years brought about by the steady increase in accidents and occupational health-related incidents. Globally, there have been increases in accidents within the construction industry as reported in countries like Great Britain, Singapore and the United States of America, (Lai and Ling, 2011:1019). Locally, there has been a general increase in construction accidents over the period 2006 – 2011, which indicates that the construction industry is one of the worst performing industries and one which requires specific focus, (CIBD, 2010: 1).Unfortunately the focus has been mainly on the wearing of Personal Protective Equipment (PPE) which includes hard hats and harnesses. Communication on construction sites can be fairly difficult given the cultural mix of groups on site. Communication may be where the safety problem starts. It has been speculated that the majority of accidents are the result of PPE not being worn during working operations. This paper looks at the impact of poor communication in the safety aspects of a site, (CIDB, 2010).

Those employed in the construction industry are also said to age more prematurely and suffer more respiratory ailments than other industry counterparts, (CIDB, 2010). The legislation pertaining to and regulating safety and health within the construction industry seems to be lacking in terms of correlating such legislation to the enforcement of safety standards. Companies seem to be 'let off the hook' relatively easily while their employees bear the consequences of the company's non-compliance with strict safety standards, (Langford, Rowlinson and Sawacha, 2000:134).

Further, there appears to be no universal standard when it comes to safety implementation and regulation. There are disparities in the manner in which incidents are reported; what actually qualifies as an incident or accident as well as when these incidents should be reported. The biggest reason for this is that there is no proper definition for safety. What is

safety? What is safety in relation to the construction industry? No globally-standard definition exists, (Gambatese, 1998). If this is the case, how is it then possible to formulate a proper and universally-accepted safety model? Standards and qualifying measures differ from country to country and there seems to be limited consistency amongst the different standards, (Hermanus, 1999). Surely a model would make project-safety implementation simpler. It would also be easier to evaluate and revise safety standards.

The cause of accidents has been linked as a direct result of unsafe working activities and conditions, which are ultimately controlled and should be monitored by management, (Holt, 2005). Management has a huge role to play in creating and maintaining safe working environments. This is inclusive of assigning tasks and responsibilities to employees. Tasks and responsibilities need to be properly communicated and a method of assessment and regular feedback must be in place to ensure that employees understand what's required of them, their managers and ultimately, the client. They will then be able to conform to the required standard the client requires. Employees seem to understand what accidents are but seem to lack the understanding of their cause and the significance of the occurrence/s of accidents on the bigger scheme of things. Management must recognize this void and take the necessary action. Management must also manage the work and social environments in the workplace and do its upmost best to promote good safety practices, (Abudeyyeh, O et al, 2005). Above all, management must lead by example.

Effective communication, that is, conveying the right message in the right manner is a universal problem, (Shohet and Frydman, 2003:571). The fundamentals of the communication process are known by most parties. However, it must be understood that communication is a major component of organizational behaviour and is also an important part of the Project Management Body of Knowledge (PMBOK) specialisation areas. More importantly, effective communication has been found to be one of the major factors influencing site safety, (Teo et al, 2005: 335). In terms of the process aspect of site safety, effective communication in conjunction with information flow, ranks the fifth most important factor influencing site safety. In terms of the personnel aspect of site management and safety, communication and safety culture rank tenth and fourth respectively in terms of their importance affecting site safety, which indicate how important it is for workers and managers to adopt safe work behaviours. (Teo et al, 2005:335). There are specialists in communication and fortunately, communication skills can be improved upon all the time. Reverting back to

organizational behaviour, the challenge for management lies in the difficulty in training, motivating and involving the construction workforce in corporate safety efforts, (Holt, 2005). The construction industry comprises many individuals differing in education levels, job titles, languages spoken, cultural diversity, years of experience, different ages, different racial demographics and more recently different genders, (Siu, Phillips and Leung, 2003). Most groups are formed along the basis of similarity or trade-specialisation. All groups on site must communicate collectively to ensure smooth productivity on site, (Loosemore and Lee, 2002:45). How do all these groups interact and inter-react? Do their differences really pose serious barriers to effective communication? Literature shows that all these differences can be embraced and that the communication model can be adapted to the various parties to ensure effective communication, (Robbins, 2005).

This research explores communication as applied in construction safety, with the aim of finding the missing link to integrate these two entities in order to minimize accident and occupational-injury rates in the construction industry.

1.2 Problem Statement

There has been minimal effort to link the communication model to a universal health-and-safety model, (Lingard, Wakefield and Cashin, 2010:31). Even more complicated is the adaptation of the communication model to the various stages of the project, (Chinda and Mohamed, 2007). The theory and practice of communication does not seem to be integrated with the haphazard nature of construction safety in the building construction industry. As a result, pressure for productivity increases, frustrations run high; inexperience and lack of proper communication lead to panic which leads to failed safety management, accidents, high occupational-health injury rates and the realization of harmful hazards, (Hermanus, 1999: 30). There is limited research which has dealt with this problem from a South African perspective. International researchers have not dealt with the matter to address sites with varying technical skills levels as well as varying literacy and language skills.

1.3 Research Questions

From the readings reviewed in the background study and the gaps in literature found therein, the following questions were addressed in the study:

- How much is safety taken into consideration when the professionals are designing and tendering for projects and do their priorities change over the course of the project?
- How can communication aid in minimizing accidents on construction sites and is it possible to generate and adopt an ideal communication model that can minimize accidents in the construction industry?
- Do employees thoroughly understand or take interest in the significance of safety in the broader spectrum of the construction project? Subsequently, what barriers influence their understanding messages and information? How are these barriers resolved?

In addition, the potential benefits and opportunity costs involved in properly implementing a safety-management programme are examined in this research.

1.4 Objectives of the study

Deriving from the research questions, the objectives of the study were set as follows:

- To understand what it is that employees really require from management when it comes to safety compliance and management.
- To investigate what managers can do for all its employees collectively so as to be on the same page when incorporating them into the safety-management programme.
- To discover cost-effective methods of implementing safety and support programmes for the duration of the project as incorporated with sound communication plans.
- To investigate on the impact a good safety record plays in a company's ability to gain additional work and consequently if there is an ideal communication-safety model to guarantee future work.
- To explore on how the Employment Equity Act, and other legislation, can be used in conjunction with safety legislation to empower employees and improve overall site conditions.

1.5 Significance of the study

Cultural diversity is visible across South Africa thus the country's label as the rainbow nation. With eleven official languages coupled with the influx of migrant labour from South Africa's neighbouring countries, as well as the relatively informal nature of the construction industry, resulting in easy access to the industry, South Africa's construction sites contain a broad mix of language and culture, (Adams, et al, 2007: 104 and Hermanus, 1999: 15). Cultural diversity is extremely apparent on construction sites throughout the country. With South Africa having eleven official languages and with the high number of migrant workers present on construction sites, communication can be problematic. Construction sites can be dangerous with high volume of machinery found on these sites and the technical skills required by this industry. As per project management principles, no two projects are the same.

This study assists managers and project stakeholders by providing them with tools to aid communication, from tendering through to construction stage. This incorporation of communication planning is just as significant as safety planning. Proper yet flexible planning takes the focus off delays caused by communication breakdown and lost-time injuries, and, rather places the focus on production and the successful delivery of the project in line with project management principles.

1.6 Scope and Limitations

- This study was limited to building construction and did not focus on road, mining or other forms of construction currently taking place. However, safety standards of these other construction forms were dealt with briefly in the literature review to ascertain how standards differed between industries and whether this eased the management of safety per industry from a regulatory point-of-view.
- The study was limited to medium to large sized companies (i.e. companies employing more than 100 employees) as it is assumed that they had a better grounding to implement safety-management programmes and due to the nature and size of their projects, were also likely to take safety more seriously.

- In terms of communication theory, negotiation and conflict-resolution was not dealt with in detail due to the magnitude of this topic.
- In geographical terms, the study was limited to the Johannesburg and greater-Johannesburg regions due to time and financial constraints. The findings from this study are not universally applicable to construction sites across South Africa therefore necessary generalisations shall apply to Johannesburg only.

1.7 Research Assumptions

- Construction sites are generally culturally and linguistically diversified (Hermanus, 1999:6), creating communication problems most of the time.
- Construction workers involuntarily perform unsafe working acts when managers/foremen expect higher productivity rates. The converse is also true: when there is less pressure on productivity, safe working acts occur involuntarily, (Goldenhar et al, 2003:217).
- The continuous positive promotion of rules and regulations will lead to them being followed and ultimately assist in reducing accident rates, (Adams et al, 2007:116-117).

1.8 Structure of the Report

The structure of this report is presented in the following manner:

Chapter 1- Introduction

This chapter introduced the research topic by means of definition, scope and the problem statement. A comprehensive background study was founded in this chapter.

Chapter 2 – Literature Review

This chapter reviewed all the pertinent literature ranging from construction safety theory to organisational behaviour and communication as well as legislation pertaining to safety,

labour relations and equality with various case studies being made reference to. This literature was used to substantiate and back-up the need for this research.

Chapter 3 – Research Methodology

This chapter discussed the type of methodology used in the research to solve the problem statement and build a case for the objectives. It included theoretical components such as the types of research methodologies that exist and then the rationale behind the choice to use the particular type of methodology to be used in this research. This chapter also outlined the data-analysis method to be used.

Chapter 4 – Analysis and Interpretation of Results

This chapter evaluated the data collected during the research as well as the subsequent significance of the results obtained from data collection.

Chapter 5 – Conclusion and Recommendations

The concluding chapter related the data findings and literature review to the original thought processes of scope, objectives and problem statement. Recommendations were offered along with areas identified for further research.

CHAPTER 2 – LITERATURE REVIEW

The Literature Review comprises prior research conducted as it relates to the main elements of communication and construction safety. Several ideologies exist which explain communication breakdown; safety management theories and application; accident/injury statistics and their causes/contributors; why human behaviour can deviate from obedient to rebellious; the complex nature of managing a diversified populace; safety-compliance standards from a legal point-of-view and the other factors which are explored in order to substantiate the significance of choosing the appropriate communication model to suit the relevant construction activity.

The appropriate choice of communication-style during the relevant phase of construction or construction activity, must be suitable to that construction phase or activity. Subsequently, styles must adapt to various stages of the project to ensure optimal performance on the whole. To complement this, there must be consensus or at least a universally-recognised standard when it comes to safety compliance to create a benchmark applicable to construction sites everywhere which will facilitate effective communication.

2.1 Legislation of construction health and safety in South Africa

2.1.1 Background

The construction industry experienced a significant boom at the start of the new millennium through to the end of the "noughties" in 2010. The industry saw a surge in the number of new SMME's and close corporations being formed, (Hermanus, 1999:3). A large proportion of the construction industry is informal in nature and less than 50% of the workforce is formally employed, (Eppenberger, 2008:11). A hazard is defined as "physical conditions with inherent qualities that can cause harm to a person, (Eppenberger, 2008: 20), and the construction industry contributes greatly to the number of hazards suffered by individuals and general members of the public. Given the nature of the business, the lack of regulation, monitoring and reporting; it is difficult to accurately report, or even calculate, the number of workplace

injuries and occupational diseases, which took place during this period, (Hermanus 1999:3). As such, more often than not, statistics are wrong and are not based on the same criteria, (Eppenberger, 2008:11).

2.1.2 Statutory law and Legislation

The lack of regulation is most probably due to the number of legislation which exist, pertaining to health and safety. Health and safety legislation approaches date back to the 1960's "when trade unions in many countries turned their attention to issues related to the "quality of working life" such as job security, job satisfaction and occupational health and safety.", (Hermanus, 1999: 4). More recently, both workers and employers are tasked with the responsibility of health and safety and both parties play a much more significant role in health and safety, (Hermanus, 1999:6). Should it be in terms of common law – judgement follows previous precedent / similar historic judgement; in terms of vicarious liability – the duty of a principal (e.g. employer) is to take responsibility for consequences or acts/omissions of agent (e.g. employee), i.e.: when someone can be responsible for acts and conduct of persons acting on his/her behalf; in terms of criminal liability – the State identifies non-compliance with regulation/legislation against offender and prosecutes from there; in terms of civil liability – the case is usually negligence; in terms of administrative liability – the company receives administrative fine as a result of breach of safety-related statutes by member of management, (Nel, WP et al, 2008**:**183).

The complexity of the health and safety sector, as governed by the Departments of Labour, Minerals and Energy, and Health, was demonstrated by Benjamin and Greef (1997) and the two main acts are represented in Table 1.1 below:

Table 1.1 A comparison between the Mine Health Safety and Occupational Health and Safety Acts of South Africa

Provision	MHSA (1996 & 1997)	OHSA (1993)
Responsible institution	Department of Minerals and Energy	Department of Labour Note: OSHA and not MHSA applies to workers in the energy sector
General Duty of Care	Includes employees, contractors and members of the general public who may be affected by activities.	Includes employees and members of the general public who may be affected by activities. Contractor safety and health is not the responsibility of the site management but the contractor

Risk Assessment	Requirement to assess risks includes provisions for maintaining of records of risk assessment activities, the inspection of risk assessment records, consultation with OHS committee over elimination and control of risks and periodic review.	General requirement to assess risks, prevent exposure to hazards and to use personal protective equipment as a last resort only.
Occupational Safety	Accident investigations to be done in cooperation with health and safety representatives and to be conducted such that underlying causes are identified. Copies of investigation reports to be made available to OHS representatives.	No specific requirement of the accident investigation process.
Occupational Health	Person qualified to deal with occupational health must be appointed. Medical surveillance to be done. Annual reports to be prepared. Incidents of serious ill health to be investigated.	Medical surveillance to be carried out if situation warrants.
Occupational Hygiene	Qualified occupational hygienist to be engaged. Medical surveillance to be done. Records to be kept. Health threatening occurrences to be investigated.	General provisions to establish an occupational hygiene program. For chemical substances detailed requirements are set out in the Hazardous Chemical Substances Regulations.
Ergonomics	To be taken into account in the design and manufacture of articles to be used in the mines.	No specific requirements.
Worker involvement	Representatives negotiate over OHS matters. Are consulted, may consult experts, may inspect processes or reports, have access to specific reports, may assist and direct workers, etc. Full-time representatives provided for.	Similar to MHSA in many repsects but emphasis on consultation and reporting to the employer. No full-time OHS-representative provision, although not specifically excluded.
Workers' Rights	To refuse dangerous work, to information, to elect representatives, to be consulted.	No explicit right to refuse dangerous work. (implicit)
Trade Unions	Representative trade unions are recognized and negotiations / consultations take place through them.	No explicit role for trade unions.
Disputes	Labour Courts, Commission for Conciliation, Mediation and Arbitration. Emphasis on conciliation and mediation.	State courts. State considers merits of case, prosecutes if persuaded to do so.

Source: Benjamin and Greef 1997; OHSA (1993) and MHSA as amended 1997.

Other legislation pertaining to health and safety include the Compensation for Occupational Injuries and Diseases Act of 1993 (COIDA), the Occupational Diseases in Mines and Works Act of 1973 (ODMWA), the Hazardous Substances Act of 1973 (HSA), the Basic Conditions of Employment Act (BCEA), the Labour Relations Act of 1995 (LRA), and the National Environmental Management Act of 1998 (NEMA). OHSA, MHSA and NEMA indicate a

more proactive approach, from government, to the management of health, safety and environmental hazards and from unilateral decision-making, (Hermanus, 1999:24). It has been reported that close to seventeen percent of accidents occurring on construction sites are fatal, (Building and Wood Workers International, 2009:41). When evaluating the causes of such accidents, trade unions have cited the gap in legislation, namely OHSA, and the Department of Labour's failure to sufficiently regulate the construction industry, (Building and Wood Workers International, 2009:41). As legislation and regulation continue to lag and the construction industry continues to grow, construction safety has often taken a back seat, (Building and Wood Workers International, 2009:43).

The global market has attempted to take a stand in ensuring safe working standards and barring the trading of those organizations and countries which fail to comply. Some such agreements are not founded on standard principles and not all parties can agree on a generally accepted standard relevant to the global market and affect trade; however some general arrangements may be made. Goods may be banned on the basis that they represent a hazard to the public or to the environment, Hermanus, 1999:16). Furthermore, goods may be prevented from existing in certain markets because of the regulations and conditions including OHS-related conditions, under which they are manufactured, (Hermanus, 1999:16).

2.1.3 Safety compliance, performance measurement and the effects of non-compliance.

Productivity-pressure and subsequently, overtime, also impact significantly on construction safety, (Goldenhar, Hecker, Moir and Rosecrance, 2003). Legislation generally prescribes maximum working hours per week. Unfortunately the construction industry is not regulated closely and with the influx of migrant workers, who oftentimes have minimal understanding of the local language, the opportunity to earn higher wages lures most construction labourers into working overtime, (Goldenhar et al. 2003). To reduce workers' injuries financial impact on the organization, workers are sometimes made to return to work on "light" duties to avoid reporting a lost-time injury, (Lingard et al, 2010:33). The consequences of fatigue, less personal time and increased accident rates often do not deter labourers from engaging in overtime activities. Safety-management models must also take this into account this component of productivity-pressure so as to ensure/enhance the successful management of projects and the entire workforce by the company, (Teo and Ling, 2006).

Construction accidents hamper productivity and site operations while also resulting in a lowered worker morale especially when these accidents result in human tragedy, de-motivating workers, delaying project progress while frustrating the client, and adversely affecting the overall cost and reputation of the construction industry, (Mohamed and Chinda, 2010:267). FEM accident statistics as at December 2011 indicate that the majority of accidents do not result in disability or death, however, a considerable amount of time is lost as the injured parties recover thereby resulting in a decreased productivity. Although the number of accidents between 2008 and 2011 decreased, this was mainly due to a substantial decrease in the number of employees working in the construction industry and consequently, FEM's accident statistics indicate an increased accident frequency rate. Given the types of injuries sustained from such accidents (muscle injuries, superficial wounds or both), it would be worthwhile to prevent such accidents from occurring in the first place. Construction companies and management in particular, must be more forceful in driving a positive safety culture and enforcing safety standards which will assist in decreasing the number of accidents occurring on construction sites, (Mthalane et al, 2008:9).

At this point, it is useful to review what several authors have reported regarding the cause or contributing factors to the cause of accidents. Factors have attributed to lapses in concentration in terms of employee's actions and behaviours; the limited capabilities of employees; poor communication as well as inadequate supervision, (Haslam et al, 2005:406). It is evident that both employees and management are blameworthy when relating the cause of accidents. Haslam et al (2005:407) also diagrammatize factors and influences contributing to an increase in construction accidents. A combination of worker factors (attitudes, communication and actions) as well as site factors (site constraints, housekeeping and local hazards) stem from originating influences such as construction education. When these factors come into play simultaneously, accidents are likely to happen. A breakdown in communication, or poor communication, continues to rank highly on contributory factors to increases in accidents, (Lai and Ling, 2011:1020). Gyi et al (2010:198) combined poor communication with inadequate training and poor procedures as factors leading to an increase in accidents.

Eppenbreger (2008) has listed the following as theories to explain the occurrence of accidents:

- The adjustment-stress theory argues that temporary conditions such as direct on-the-job stress caused by unrealistic, unattainable goals set by managers as well as factors imposed by the construction client, like accelerated deadlines and cost constraints lead to an increased risk of injury.
- The distractions theory maintains that should productivity be increased, hazards must be eliminated so that less attention is paid to them by the workers. Subsequently when there is less focus channeled at a number of activities at once, workers focus all their energy on production and will feel less pressured by the need to achieve targets therefore experiencing fewer accidents. However, it may be possible that a person is considered the source of the hazard, as he/she is not in the proper state of mind and therefore places himself or herself at risk, (Eppenberger, 2008:20).
- The chain-of-events theory explains that worker negligence could be attributed to factors such as poor working conditions, inadequate management systems and company policies, demotivation, personal problems, time constraints, etc. More often than not, in the chain of events leading to an injury lies a management-related failure or oversight leading one to believe that construction managers, top, middle as well as team leaders all have a role in changing the course of a potential accident-causing situation. The warning signs are always there and need to be taken seriously as they occur before they build up and inevitably cause harm, (Eppenberger, 2008:21).
- The constraint-response theory states that each participant in the lead up to an accident experiences constraints on their activity. Their responses to these constraints in turn lead to further constraints placed on subsequent participants in the process. These constraints and associated responses eventually manifest themselves downstream in the proximal factors or failures. The proximal failure leads directly to the risk of exposure or accident involving the worker, (Eppenberger, 2008:18-23).

Some other recent accident causation models include Nishishima's fishbone model where it is brought forward that four related factors lead to unsafe acts or conditions, namely human, equipment, work and management factors, (Eppenberger, 2008:25). Five causal factors make up the socio-technical pyramid. These factors are engineering reliability, operator reliability, communication and feedback control, organization and management, and finally psychological climate, (Eppenberger, 2008:25). Important elements of these factors are dealt with in the following subsections in this chapter.

The design team must take into consideration the safe constructability of their designs and the potential consequences thereof, (Behm, 2005). The contractor's mandate is to construct the element as designed by the professional consultant. However, if 'wild' designs are to be put in place, this endangers the safety of the construction labourer. "By addressing safety during the design process, hazards will be eliminated/reduced during construction, thus improving the safety performance of the constructor…Owners or financiers of construction projects seeking a safe construction site should consider mandating that design professionals and construction managers utilise the design for safety concept", (Behm, 2005). Both the clients and government must enforce stricter compliance policies but must also provide incentives to assist the professionals in complying with and prioritising safety standards.

Construction being the robust and dynamic industry that it is, OHS management is difficult to determine. The measurement of deaths, injuries and illnesses alone cannot determine proper OHS performance per construction project, (Lingard, Wakefield and Cashin, 2010:35). Employers should adopt a more proactive approach towards the management of OHS risks regardless of whether such venture is likely to increase the costs of production, (Holt, 2005). Such costs will offset the economic pressures and regulation standards placed on companies operating in competitive environments thus persuading all employers to invest in occupational health and safety, (Saurin et al, 2005:286). However, without set universal standards the regulation of firms that compete in the global market will be complicated, (Hermanus, 1999:12).

In terms of managing OHS risks proactively, the following measures are used by companies:

Safety performance management by all affected parties; the accountability for safety performance; the measurement and benchmarking of safety performance and the responsiveness by employers to workers' safety initiatives; Safety performance auditing; visual observations in and around the workplace; the evaluation of the workplace environments, possible hazards, accident statistics as well as the interviewing of workers to substantiate findings and planning corrective action after such evaluation. Contribution made by workers to the level safety performance in the company should be analysed as well as the relationship of safety achievements to other forms of performance review, (Nel, WP et. al, 2008:185).

2.2 Communicative Culture and Behaviour in relation to safety

2.2.1 Human Culture and Safety Culture defined

The attitude towards safety behaviour forms part of the culture in the organisation thus, a positive safety culture must be promoted within the organisation, in an effort to improve the incidence of incidents on construction sites, (Teo et al, 2005: 337-340). When safety and healthcare are promoted, employee awareness is heightened and they are likely to take a more positive view in ensuring their own health and safety, (Adams et al, 2007:116-118). As each employee is also an individual, it must be recognized that organizational behaviour and behavioural sciences play a significant role in safety management, (Larsson, Pousette and Törner, 2007). Essentially, safety is governed by rules thereby making safety compliance a learned behaviour. Also, individuals differ in behaviour but upon careful observation it is noted that individuals respond to safety barriers and reinforcement in the same general manner, (Larsson, Pousette and Törner, 2007). It is therefore possible to establish a general safety model which can be applicable for most, if not all, sites. One of the approaches drawn up to encourage safety compliance, behaviour-based safety, focuses on positive occurrences, which will enable management to deduce and act upon possibility for failure, (Holt, 2005). This approach has been found to result in increased productivity on site due to less time being dedicated to the resolution of safety incidents. However, this approach has been found as difficult to implement at a practical level and has been found to require substantial amounts of effort and time to implement properly.

Stranks (2007) differentiates the difference between culture and safety culture with culture being a state of commonly accepted manners, taste and intellectual development or improvement of mind and/or tastes via education and training. Stranks (2007) goes on to define safety culture as "the product of individual and/or group values, attitudes, competencies and patterns of behaviour that determine the commitment to the organisation , the style and proficiency of an organisation's health and safety programme". Organisations with a positive culture are characterized by communications founded on mutual trust, by shared perceptions of the importance of safety, and by confidence in the efficacy of preventative measures, (Stranks, 2007:354-355).

There are many parties taking part in the construction process; all with different roles, goals, expertise and skills, (Eppenberger, 2008:11). The design team also has a role to play in health and safety. Engineering ethics are the moral issues, decisions and related questions about good conduct, character ideals and relationships of people facing engineers, (Nel, WP 2008:184). Engineers and architects are forced to take cognizance of the impact of the complexity of their designs as well as their approval during the various stages of the construction process in the overall health and safety plan of the project, (Gambatese, 1998:108).

Stranks (2007) lists following factors as being the outcome of an organisation's safety culture:

- The practices, assumptions and beliefs of directors, managers and employees
- The attitudes towards safety culture throughout the organisation
- Policies and procedures
- Supervisor priorities, responsibilities and accountability related thereto
- Action, or lack of action, by managers to address and correct unsafe behaviour
- Productivity pressures
- Training and motivation of employees as well as feedback relayed to them
- Extent of employee involvement, consultation and actual "buy in" of philosophy.

In organizations with strong safety culture, ALL employees and especially senior managers accept responsibility for safety and pursue it full force in a committed manner. Such organizations experience less risky behaviour, low accident rates, low labour turnover, low absenteeism, high productivity, (Stranks 2007:355). The actual management techniques used by employers will be dealt later; however, the basic principle in understanding messages and based on the FIDO Principle: F – Frequency; I – Intensity; D – Duration; O – Over again, (Stranks, 2007:280-281). This may be implemented by organisation to create a positive attitude towards safety thereby strengthening safety culture.

2.2.2 Behavioural elements of safety culture on construction projects

Starken and Cartwright (2001:7), advocate that human understanding of imagery is dependent on the broader cultural meanings as images invoke, as well as the social, political and cultural contexts in which they are presented as well as any clues, which may provide a more thorough understanding. Meanings and understanding are obtained when the image is viewed and interpreted. Memory, past exposure and perceptual qualities assist in interpreting symbols with added text thus leading to the easier processing and storage of such material by most people, (Starken and Cartwright, 2001:9). When individuals are exposed to safety information, the complexities lie in their ability to interpret the meaning of short or abstract signs and symbols correctly, (Starken and Cartwright, 2001:11). This therefore suggests that images may be received quicker than verbal mediators for relevant associative information may, (Starken and Cartwright, 2001:18).

Warnings, specifically from the sender, must be explicitly unambiguous so that all recipients comprehend that the likelihood of injury or death is high and/or extremely hazardous, (Starken and Cartwright, 2001:12). Most safety signs have been developed internationally and therefore do not cater for environments where individuals' interpretation could be affected by cultural, social and poor educational backgrounds. As such, this point calls into question the applicability internationally-designed signs have within the South African context, (Howell, 2008:71). National and international experts responsible for creating such standards tend to have differing opinions on these standards therefore not all proposals become standards by consensus, (Saurin et al, 2005:284). Disagreement has come into sight as to whether or not these signs communicate the intended concepts to targeted populations effectively. The ultimate principle of safety signs is behavioural compliance. For this objective to be attained, signs need to influence people's behaviour in ways that do not lead to personal injury thus testing a person's comprehensibility proves in effectively developing and revising safety signs, (Howell, 2008:5).

Howell (2008) defines visual literacy is the ability to read, interpret and understand information presented in pictorial/graphic images and is associated with visual thinking, which is described as the "ability to turn information of all types into pictures, graphics, or forms that help communicate information", (Shohet and Frydman, 2003:573). It has been argued that visual literacy education, which is a more visually oriented system, can lead to

broader cognitive benefits, providing learners with a set of mental tools that will aid their understanding of both physical and social environments, (Eppenberger, 2008:25-26).

Apart from visible signage, other mediums also assist in fostering safety culture on site. Studies have shown that workers who regularly attend H&S training sessions had fewer accidents comparatively, despite their "high risk" profile, (Eppenberger, 2008:18). This may be due to the workers' continued awareness to be proactive towards maintaining positive safety practices on site. This state of awareness is a learned behaviour coupled by enhanced knowledge and is therefore boosted by the reinforcement of such practices to the workers on a regular basis, (Musonda and Smallwood, 2008:82).

Managers' OHS behaviours and communication in OHS matters are consistently linked to OHS performance in an industrial context. Since line managers and supervisors spend most of their time with the workforce, they have stronger, more direct influence on subordinates' OHS behavior than on executive or office-bound managers (Hare and Cameron, 2011:569). Further research reveals that social processes within work groups may influence the OHS behaviour and performance of group members, (Lingard et al, 2010:37). They contribute greatly to the way safety is perceived on site and as such, would benefit from having good emotional intelligence. This way, they are always aware of their surroundings, the feelings and attitudes of others and are able to manipulate these situations and inspire workers to behave in a manner that is responsible and aware of safety.

2.2.3 Communication

Communication has been defined as the exchange of interpretations and intentions so as to accomplish mutual understanding and to gain a response from both parties involved in the interaction, (Robbins 2007). As stated by Emmitts and Gorse (2007), "the point is to have one's informative intention recognized." Communication on construction sites is rather unique and dynamic and must be fluid thus well-tuned in order to be effective. To do so, one must understand the fundamentals of communication.

Interpersonal communication may be verbal or non-verbal. Verbal communication relates to written and word-of-mouth communication patterns, while non-verbal communication relates to body-language, gestures, traits, habits, symbols and other somewhat hidden characteristics that convey a message and aid communication, (Shohet and Frydman, 2003: 572). One

construal emphasizes that "language is ultimately made up of symbols therefore the word "cat", whether spoken or written, is not a cat but rather a symbol for a cat", (Howell, 2008:6). As such, graphical signs are often used in order to relay important safety data in organizational and community settings with the purpose of reducing eliminating workplace injury, (Howell, 2008:7). This is done by ensuring that such signs communicate, articulate, unambiguous information to all individuals, (Howell, 2008:7).

Verbal communication is easy to get right when only one language is being used by all, (Trajkovski and Loosemore 2005:448). Mutual understanding, on a verbal platform, is easily understandable. Conversely, it may also lead to disastrous outcomes. Loosemore and Lee (2002: 34) state the challenges associated with managing a multi-cultural site. They discuss inter-cultural communication as it relates to cultural variables and state that "culture not only determines who talks to who, about what and how they encode messages, the mediums they choose to transmit them and the way that the symbols (both verbal and non-verbal) contained in the message are interpreted." This creates challenges for maintaining fluidity on construction sites but it is fair to say that both forms of communication, verbal and non-verbal, can be learnt/improved although require practice and understanding so as to achieve the desired execution. Practice and understanding can be acquired from developing one's communication skills. Both management and employees, and any other stakeholders, should be trained in developing their communication skills as cross-communication takes place throughout the project's life-cycle, (Musonda and Smallwood, 2008:84). The ultimate goal would be the achievement of the right message communicated and interpreted correctly.

The basic communication model may be depicted as:

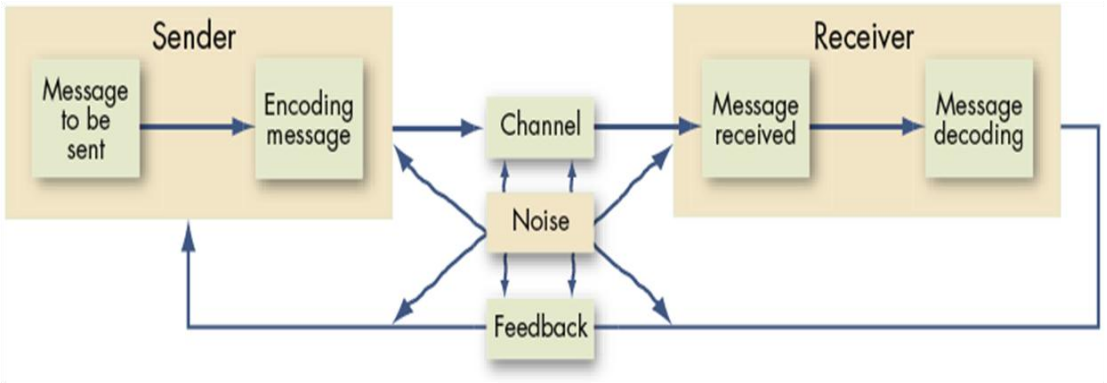


Figure 1.1 The Communication Process Model

(sourced from Robbins, 2007, Organizational Behavior, Ninth Edition, New Jersey: Prentice-Hall International, Inc.)

To explain the figure above as obtained from Robbins, (2007), the sender creates the message he would like to send and encodes it to the receiver; the receiver receives the message and attempts to decode it and find the sender's intended meaning. When the parties have common ground and shared understanding, the sender is able to easily tailor the message to suit the recipient's requirements thus convey the message effectively. Several problems may exist if the parties involved in the interaction are neither on the same page nor willing to understand each other, Robbins, 2007). Chaos can result amongst parties on site, which may contribute to an increased accident frequency rate, (Leung et al, 2010:314).

Stranks (2007) has listed the following as barriers to communication:

- The communicator being unable to think clearly
- Difficulties in encoding the message by receivers
- Interruptions in the transmission of the message by distractions such as noise
- Selective reception, interpretation and retention of information by the receiver
- Unsuitable environment, eg: workshop/construction-site, will act as an impediment to good communication
- There is no perceptible reaction from the receiver
- Rumours which have already filtered through the communication system which alter the decoding of the message by the receiver, (Stranks, 2007:281-282).

Other barriers information overload, communication apprehension, status, emotions, cultural factors, language and filtering, (Trajkovski and Loosemore, 2005:446). Should there be any bit of uncertainty regarding the message, both parties should be able to exchange information and ask questions (a process referred to as "feedback") so as to be able to fully understand the message. "Poor communication, lack of consultation and inadequate feedback are among the primary cause of construction faults and mishaps, (Emmitts and Gorse, 2007). One of the keys to ensuring fluid communication is by paying attention to non-verbal reactors. Individuals with high emotional intelligence are able to pick up on this and direct their communication appropriately. Auditory sensors explains how people hear and their non-verbal responses, (Stanks, 2007:288). Once individuals know how to pick up on this, they can learn to handle the situation accordingly.

Management must go the extra mile to promote open and fair communication. This is inclusive of uplifting and critical statements as well as providing language assistance, (Trajkovski and Loosemore, 2005:446). Cultural diversity management is the compromised understanding of the philosophical tensions surrounding race, organizational, equality and societal matters, (Kersten, 2000:236). Management must also appreciate the competitive advantage which can be gained from cultural diversity on site, (Trajkovski and Loosemore, 2005:447). As much as open communication can be effective, it must also be managed fittingly. All parties involved in the communication process must be "equipped with the appropriate communication skills" to avoid unnecessary situations of conflict and destroyed relationships, (Emmitts and Gorse, 2007). Best practice is said to be characterized by mutual, open interaction while exchanging information and understanding different cultures which will help encourage responsibility and ownership of tasks which will then be delegated, negotiated and distributed amongst the relevant parties, (Ducharne and Bernard, 2001:643).

Communication over the life-cycle of the project will not be the same. During periods of high stress and increased activity, communication is likely to decrease. Conversely, the opposite should be true. During such periods communication should increase, (Choundry and Fang, 2007). During periods of high stress, increased and effective communication is a difficult feat to achieve. This may be due to the level of activity on site and which is complicated by the fact that everyone handles stress differently, (Ivanov and Werner, 2010:20). This is where training and communication development skills become necessary to help promote effective communication, (Loosemore and Lee, 2002:41.) Organisational, economical and psychological factors as well as productivity pressure, job security, education , experience and training all affect communication and subsequent behavioural patterns associated with safe working methods, (Choundry and Fang, 2007). It is also indicative that this process requires critical and ongoing management. Meetings provide insight into what is actually happening on site and how people feel about certain matters which may need to be resolved. Management must be completely aware of this and manage it properly. At the same time, management will also require ongoing training.

Where meetings are concerned, the ultimate purpose is to engage in structured communication sessions with an agreed goal and objective, (Emmitts and Gorse, 2007). Meetings must be conducted properly and be viewed as relevant and important so as to avoid defeating the purpose of conducting the meeting in the first place. Where the awareness of

H&S is concerned, this topic must be added to the agenda at weekly meetings, (Musonda and Smallwood, 2008:81) The meetings must also be kept focused in order to achieve the task at hand. This will reduce attendance-apathy to meetings.

Different types of meetings may be held concerning safety and health on site. The first is the pre-start meeting which is held between the principal contractor and the subcontractor prior to the subcontractor's arrival on site. The matters to be discussed include the client's and principal contractor's stances on safety, and the acceptance of the Health and Safety Policy to be adopted for the duration of the project , (Emmitts and Gorse, 2007). Hereafter the subcontractor will be able to review his safety plan and work schedule so that it fits in with what the client has in mind and what is required from a legal-compliance point of view. The next type of meeting which can be held is the weekly safety meeting, the purpose of which is to provide the subcontractor's and principal contractor's working teams with the platform to discuss standing and new matters regarding safety and safety-related practices on site. It would be wise to use interpreters to facilitate communication amongst all parties, (Bust, Gibb and Pink, 2007).

Safety-related practices include all health, occupational and environmental issues which may exist pertaining to the site. In between weekly and monthly meetings, informal meetings related to safety may also be held so as to solve urgent safety matters. The last type of meeting which may be conducted is the monthly safety meeting. This is held amongst the senior members of the subcontractor's and principal contractor's organisations in order to "review reports and recommendations and to review minutes of the weekly meetings" and resolve matters which are in need of managerial intervention, (Musonda and Smallwood, 2008:83).

Given all the types of meetings that take place on construction sites, it continues to puzzle researchers why the construction health and safety record is amongst the worst in relation to other industries, (CIDB, 2010). Research has shown that organizations ought to offer a platform to clearly communicate their safety policy from set goals and objectives, which in effect, relates positive safety culture and records stemming from effective communication, (Lai et al, 2011: 1020). It has been reported that by encouraging open lines of communication between management and employees positive safety behaviours are reinforced and as such, safety compliance and awareness increase positively, (Aksorn and Hadikusumo, 2008: 713).

Furthermore, safety standards and enhanced safety policies are created by effective communication and information transfer between management and employees, (Teo et al, 2005: 331).

2.3 Organisational behavioural concepts in relation to safety

2.3.1 Organisational culture and behaviour towards safety

It has been argued that only a performance measurement tool that has a number of different but complementary perspectives would enable organizations to pursue incremental safety performance improvements, (Mohamed and Chinda, 2010:26). Furthermore, the most meaningful interventions should be made at design or pre-production stage in order to have a significant effect, (Hermanus, 1999:14).

Cost, time, quality and safety are important characteristics of every project, (Abduyyeh et al, 2005:169). More often than not, there has been greater emphasis on cost, time and quality at the expense of safety thus resulting in a high chance occurrence of accidents, (Lubega at al, 2000:1). The challenge is impounded even further when organizations need to consider building a multicultural literate workforce when trying to create cultural diversity, (Kersten, 2000:236).

Construction projects are robust and unique thus each project is unique, (CIBD, 2010). The dynamicism of the construction industry often means that construction workers regularly face unfamiliar or long-forgotten scenarios thereby forcing them to find quick and effective solutions to these problems, (Teo and Ling, 2005:1584). Since solutions need to be quick and momentarily-feasible, they are very often outside the bounds of required or legal means which can lead to an increase in health and safety risk, (Eppenberger, 2008:11). In attempting to manage and measure OHS performance, it may be useful to establish clear OHS criteria. To aid the making of OHS decisions, managers should consider the congruity of such decisions with stated values, benchmarks based on global trends, theoretical versus practical technicality, the anticipation of potential challenges and threats, and acceptability to the public, (Hermanus, 1999:15).

Systems must be put into place to manage OHS and OHS performance properly, (Clarke, 2004:420). Hermanus (1999) details The Systems Approach to OHS stemming from the idea that within companies, junior managers, supervisors and labourers enact whatever behaviour is emanated from the top and that the power and influence of the boardroom set the tone for OHS management. However, there seems to be more power and influence within line management, power which must be delegated to this group from above, (Lingard, Cooke and Blismas, 2011: 162). There has however been much debate over what OHS management systems entail in practice and whether they are of real value, (Hermanus 1999:11). All parties involved in construction projects are said to be stakeholders in the project yet OHS decisions stem from the top most of the time. Thus, decisions are made by participants with limited interest in the daily site operations and whatever decisions they make may prove meaningless to those on site, (Lingard, Wakefield and Cashin, 2010:32). Effective systems clearly define and assign OHS responsibilities; involve senior managers, supervisors, worker-OHS representatives and OHS committees in a planned and well-managed way, (Hermanus, 1999:11).

Eppenberger alluded to Heinrich's "axioms of industrial safety" as follows:

- Injuries result from a sequence of factors, the last of which is the accident itself.
- Unsafe acts of persons cause the majority of accidents
- Three hundred narrow escapes from serious accidents will have occurred before a person suffers injury caused by an unsafe act.
- The severity of the accident is largely a matter of chance.
- Accident prevention methods are similar to those methods used for cost control, quality control and production management. Management is in the best position to initiate accident prevention strategies.
- The art of supervision is the most important influence on successful accident prevention.
- The humanist view of accident prevention can be usefully enhanced by a consideration of economic forces, (Eppenberger, 2008:17).

The cause of accidents is a multi-faceted phenomenon, the causes of which are indicated in Table 2.1 below.

The observations , in Table 2.1, were made by Lubega et al (1998) in relation to a number of construction sites in Uganda:

Table 2.1: Findings from observations on Ugandan construction sites

VARIABLE	DESCRIPTION OF OBSERVATION
Quality Materials	The enforcement of Standard Specifications for building materials is still a problem. Quality control is only carried out on 59% of sites. Structures constructed out of poor quality materials are usually very weak and prone to accidents.
Supervision	Most supervising authorities have not been carrying out their duties to the required magnitude. A large number of designers do not follow up to supervise the works during the construction stage either because of lack of commitment or lack of facilitation from the client. The majority of projects are supervised by technicians and these form the bigger supervision force outside Kampala and in most rural areas, probably because of the economic situation prevailing in the country, which forces developers to search for cheap labour.
Safety on Site	There is a weakness in enforcing safety and health regulations and lack of maintenance. There is also little regard for insurance, which most people take to be a waste of financial resources, and so do not realize the benefits which accrue from taking insurance covers. Safety is on the whole, not given adequate consideration in the construction industry whereas there is at least one potential source of accidents on every site. There are indeed very few organizations that adhere to safety and health regulations.
Safety and Productivity	There is on the whole lack of motivation whereas there are quite often tight production targets. There are hardly any safety provisions on the majority of construction sites. On the other hand, many workers do not use the personal protective equipment issued to them whereas it is for their own protection. This has a negative bearing on their productivity.

*Source: Lubega, Kiggundu and Tindiwens, 1998: 8.*i

The findings deduced from Table 2.1 indicate that the problem with accident rates begins with the poor quality assurance from designers and suppliers. Quality standards are not mentioned, however, one may deduce that there are no standards or that the standards are not adhered to or checked. As such, poor quality structures result which contribute to the number of accidents occurring. Lack of supervision seems to be the biggest contributor of accidents/ Designers often do not check construction works during construction and those doing the supervision tend to lack the adequate management and supervisory skills. With more emphasis being placed on production, there is disregard for safety rules and their enforcement. There is also disregard for safety insurance. This apathy for safety regulations and ethics leads to negative site morale and more accidents.

2.3.2 Safety models – developing and implementing safety models

Holt (2005) defines a safety program as an outline of the safety policies, practices and procedures, and should provide actions that must be taken to regulate the factors that cause accidents, and systematically integrate them into day-to-day management and operation of the company. Use of safety equipment should support the clerical and technical functions and should, therefore, form part of the safety program, (Hermanus, 1999). Administrative control should also include clear definition and assignment of responsibilities (Lubega et al, 2000:10).

Since the 1970's policy makers and regulators have relied on either of two mechanisms to create more consistency between economic goals and occupational H&S, which are reasonable practicable test and cost-benefit analysis, (Hermanus, 1999:12). A plan or policy will be reasonable and practical if it proves to be cost-effective overall.

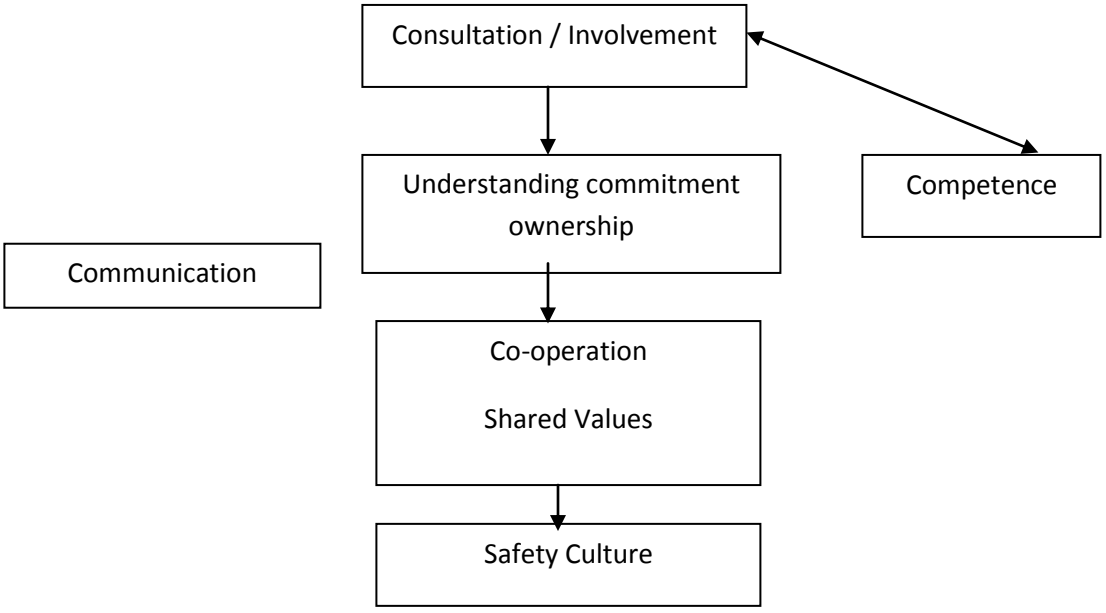
According to Stranks (2007:358), building and developing a safety culture must contain components such as senior management commitment and buy-in from the bottom-up; building trust amongst management and staff; self-assessments supported by benchmarking techniques; ongoing management training; inclusive committee representation of all levels of the organisation to facilitate, support and direct the change-management process being undertaken; shared vision; role definition; accountability; feedback; policies for recognition; awareness training and commencement; process changes; performance management;

communicating the results; reinforcement, re-assessment and correction. Lai et al (2011: 1020) also allude to the positive effect senior management's commitment to safety has on safety culture. To elaborate, reference was made to Williams and Geller (2008) who stated that "effective safety-related communication improves an organisation's safety culture", Lai et al, 2011:1029). With the above-mentioned components in place, a safety culture can fall into place with ease, its progress tracked and improvements made where and when necessary.

To improve the safety culture on site, it is advised that the following measures be put in place: effective communication across the various levels within the organisation, construction team and the general public; strong and visual commitment to safety compliance from senior and managerial levels; the attainment and maintenance of good safety records by maintaining positive working environments and safe working conditions, (Teo and Ling, 2005: 1586).

The following diagram depicts the suggested proactive nature of management must be proactive.

Figure 1.2 The Proactive nature of Management



Sourced from Emmitts and Gorse, 2007

To explain the diagram, safety culture is the result of a number of process beginning with consultation and involvement by all parties as well as other important factors and being aided by communication throughout the process.

2.3.3 Safety management and managing teams

Ergonomics refers to 'the applied study of the interaction of people and the environment around them', (Holt, 2005) and it therefore involves the integration of scientific methods and human capabilities in order to design for enhanced performance in the workplace. The focus is therefore to tailor work specifications and work equipment as adapted to the employee thereby empowering the employee, maximizing employee performance and minimizing accidents and long-term effects of pollutant-exposure. In order to achieve safety goals on site it is imperative that safety inputs be predicted accurately. Input is negatively affected by insufficient funds dedicated to safety. Safety is an area where contractors attempt to cut costs so as to realize greater profits, (Root, 2005:57).

The components of overall safety management are a well-thought through and maintained policy; proper organisation; thorough planning and implementation; ongoing monitoring; analytic reviewing and auditing performance, (Teo and Ling, 2005:1584). Some researchers have questioned the significance of safety management but it has been shown that the implementation of safety management reduces costs and enhances a positive safety record for the company, (Holt, 2005). It has also been stated that management is ultimately responsible for the safety of its employees and their future well-being. Management must be fully committed to ensuring safety compliance and the maintenance of its employees' occupational and health requirements, (Abudayyeh, O et al, 2005:169).

Holt (2005) defines safety management as "all the techniques which promote the subject and is concerned with influencing human behaviour, and with limiting the opportunities for mistakes to be made which would result in harm or loss", (Holt, 2005). As mentioned in the background, there exists no benchmark for safety compliance and each country has its own standards, (Musonda and Smallwood, 2008:88) and levels of measuring risks to the extent whereby accidents are categorized differently which ultimately affects statistics and the manner in which safety techniques are applied. Ultimately, the aim of every safety-

management programme would be to recognize and eliminate hazards and then assess and control the risks which remain, (Holt, 2005). A risk is defined as the likelihood of a mishap occurring and assessing the all possible outcomes of that mishap occurring. Safety management is therefore an ongoing process requires constant re-evaluation and monitoring, (Teo and Ling, 2006:1587).

The objectives of a safety-management programme have been diagnosed to include incorporating all parties involved in the project (from employees to management to the professionals) in a united effort to promote health and safety; to tailor work methods, equipment and design so as to reduce potential hazards and risks during the project; to maintain motivation while training and educating the various parties involved in the project so as to identify hazards and taking corrective action where necessary; to implement a fitting inspections and monitoring method for the safety programme and promote efficient feedback; and to ensure compliance with the relevant regulatory authorities and standards, (Teo and Ling, 2006:1587). Holt (2005) says that safety is "a condition of employment and is as important to the company as production, quality or cost control." From this, it is deduced that safety management should be high on the list of priorities for management as well as the fact that management must not take the value of a human life for granted, (Saurin et al, 2005:295).

Performance measurement is an evaluation-technique used for reviews of OHS practices and organizational processes. Furthermore, it may be beneficial for comparative analysis and benchmarking for one organisation to the next operating within the same industry, (Lingard et al, 2010:31). Performance indicators can be quantified by tangible data such as the number of injuries occurring within a given time or the number of OHS inspections conducted or they can be qualitative data such as descriptors of labourers' opinions about management commitment to OHS, (Lingard et al, 2010:32). It is wise to get performance measures indicators during the project and not afterwards so that corrective action can be applied and tested effectively. When used in this way, under-reporting is encouraged.

Measurement of the safety climate scenario has been plagued by a lack of consistency when reporting on the number of climate components and a failure to replicate different climate models across organizations and industries while expecting similar, positive results, (Hermanus, 1999:28). Theorists have suggested that no universal or ideal set of safety climate

criteria exists. There may be commonality with some of the components of safety climate which may include components management commitment to OHS; line-management OHS behaviour; the prioritisation of OHS over production and time pressure; and the quality of safety-related communication within the organization, (Lingard et al: 2010:34).

Correlating safety-model development with communication, the following can be applied: creating a list of topics (with direct relevance to the group concerned) to be covered for the specific conversation and the formulation of a labour/task-specific training programme; frequent training sessions (≥30 minutes); engage all stakeholders to clear out misunderstandings or concerns; eliminate boredom and lack of interest; encourage feedback and suggestions, (Stranks, 2007:285).

2.4 Conclusion

The literature presented has confirmed that cultural diversity is extremely evident on South African construction sites, and globally. Cultural diversity brings with it different values, beliefs, languages, skills and customs. Language and skill form the main topics in this research where communication needs to take place amongst workers of differing skill levels, be it lingual, technical or literacy skills. The literature has suggested theoretical ways in which this communication transfer should take place. These were evaluated in the data collection and analysis.

The literature also explored the prioritisation of safety regulation on site. It seems apparent that managers lack the skill to manage safety effectively. They also lack the confidence in their ability to do so. Furthermore, they seem to lack the communicative skills to enable them to manage safety effectively. In South Africa, this could be due to language barriers since most managers know only one or two languages, which more often than not are not spoken by the workforce. This is evaluated in the findings. The adequacy of their training is also evaluated in the findings. Managers are also placed under pressure to achieve targets which takes the focus off safety. The relevancy of this statement to the South African construction industry is tested in the findings.

With the literature and data presented in this chapter, the study moves onto the next chapters, research methodology and data collection and analysis, where it is explained how the research was conducted to assist in building a case for the research objectives.

Chapter 3: Research Methodology

This chapter details the methodology theory, methodological design and the rationale for choosing the design in relation to the research objectives. The data collection methods, data management and analysis are also explored in this chapter as a pretext to the following chapter. This chapter forms the overall foundation of the research and contributes to the significance of the subject matter.

3.1 Methodology and Methodological Design

Methodology refers to 'the framework associated with a particular set of paradigmatic assumptions used in conducting research', (Bak 2004: 23). Methodological design refers to 'the plan for conducting the research which includes the methodology, techniques and tools/devices to collect data while taking cognisance of the benefits and disadvantages of the various methods and choosing one which is best-suited to the study, (Bak 2004: 25).

The fundamental design methods are qualitative and quantitative design. Qualitative data revolves around the use of questionnaires, surveys and interviews… data that is literal in nature. Quantitative data revolves around the use of experiments and other mathematical components which will make the data numerical in nature, (Leedy 1974: 56). The two methods are summarized in the table below:

Table 3.1. A comparison between Quantitative and Qualitative Research Methods

QUANTITATIVE METHOD	QUALITATIVE METHOD
Paradigm: positivism, empiricism,	Paradigm: subjectivism, interpretivism, constructivism
Methodology: scientific method, hypothesis-driven, deductive, reliable, valid, reproducible, objective, generalisable.	Methodology: ethnomethodology, phenomenology, ethnography, action research, inductive, subjective, idiographic, intuitive.
Methods: large-scale, generally surveying.	Methods: small-scale, interviewing, observation, document analysis.
Data Type: Statistics	Data Type: Thematic exploration

Sourced from (Bak, 2004)

Some of the above terms, as relative to the study, are now delved into. These are types of research methods used to conduct a study. Research methods must answer the research questions and either prove or disprove the research hypothesis. The aim is to create a tight relationship between the research questions and methodological design, (Knight and Ruddock, 2008). Phenomenology epitomizes sensory feeling where the goal is to 'gain an intimate understanding of people, places, cultures and situations through rich engagement and even immersion into the reality being studied', (O'Leary 2004:33). Ethnomethodology delves into the behavioral aspect of engaging in research whereby researchers make sense of their social world and accomplish their daily actions, (O'Leary 2004: 36). Evaluation studies what has already been implemented before and how effective that implementation was. Applied research attempts to tailor-make specific elements to suit the perceived environment, (O'Leary 2004: 38). The historical method is one whereby the researcher evaluates the hypothesis based on the latent meaning of historical events so as to thoroughly "assess the meaning and to read the message of the happenings in which men and events relate meaningfully to each other.", (Leedy 1974:63). The researcher will therefore study various pieces of evidential documents from which he will draw his information to draw his conclusion.

The descriptive/normative survey method is one whereby the researcher evaluates events as they are happening. The researcher conducts his own field study and evaluates as accurately as he observes it. This is largely an observational form of research collection where the researcher chooses data to suit his research hypothesis and presents the results obtained from which he draws his own conclusion, (Leedy 1974:36).

The experimental method is an investigative research method where the researcher aims to find the cause-effect data to prove his hypothesis. An element of control is utilized in trying to evaluate a range of scenarios to pinpoint the true cause-effect relationships amongst the data. This type of research method requires careful planning as the researcher must design his data to suit the required outcomes to suit the hypothesis, (Leedy 1974:45).

Given the theory mentioned above, the study was conducted using the following methods:

Case Study: to give a more thorough exploration of the topic and to be able to analyse the literature read thus far. Three companies were selected to collect data from. This concentrated approach to research methodology would assist the study in being able to distinguish the

norm for the construction industry and then propose a norm which the model and recommendations would be based on. Murray & Dickson, the construction division; Tyris Construction, and Wilson Bayly Holmes-Ovcon or WBHO, the building construction division, were the companies selected to participate in the study. M&D is a medium-sized firm working on a variety of commercial projects and using different contracts, which differ in their safety-specifications. Depending on the client use, they either use JBCC or NEC contracts. Tyris Construction is a medium-sized firm based in Pretoria specialising in commercial and retail construction. WBHO is a large corporation with several infrastructural divisions. The company has a rich history with experience in many sectors and markets having done work all over Africa.

Survey: several questionnaires were formulated and distributed amongst several role players, namely managers and safety officers as it was thought that they were more likely to spend the required time needed to go through and fill in the questionnaires in a reasonable and understandable manner. Both groups were also able to complete the questionnaires in their own time as opposed to the general labourforce who had fixed working hours and was less likely to peruse the questionnaires and fill them in accurately. The survey method was intended to save time in terms of data collection and it allowed for specific questions to be asked on a general level, i.e.: data that may be classified as binomial thereby only requiring 'yes' or 'no' answers. All questionnaires were planned thoroughly and checked by supervisors and willing participants prior to the documents being used during the process of data collection.

Interviewing: this was appropriate for the study because immediate answers were obtained thereby allowing interaction to flow more easily. It also enabled the interviewer to translate the questions into two popular vernacular languages, isiZulu and Sesotho so that a wider and clearer response was obtained from participants. The threat of 'groupthink' was safely guarded against by encouraging active participation by all parties and perhaps even indirectly causing dissent to promote constructive debate. Voice recorders (found in cell phones) were used in conjunction with writing pads to ensure the quality and credibility of the obtained data.

Previous authors, such as Aksorn and Hadikusumo (2008: 720), used a similar approach of the descriptive interview and survey method. Interviews followed the surveys in order to

ascertain and clarify answers obtained in the surveys. In terms of this report, a similar approach was adopted. Interviews were conducted with labourers, management and SHE officers. Labourers were interviewed on-site, preferably close to 'tool-box talks' as that was when they were most likely to form a collective as 'tool-box talks' were compulsory to attend. Three groups of ten diverse individuals (one group per company) were interviewed for the study. Due to productivity constraints, it was not possible to interview every labourer thus, a sample group was chosen. Managers were interviewed at their places of work, either on site or at their offices, by appointment. The ability to obtain quicker and more honest feedback, via body language as well, had a significant impact on the study/data analysis. Questions were sent to the participants prior to the interviews taking place to enable the managers to prepare and to make them feel more comfortable. The questionnaires were used as a guide and certain and/or additional topics were discussed in more detail to keep the data reliable. This is also assisted in avoiding information redundancy.

SHE officers were interviewed at their places of work, also by appointment. By interviewing these officers, the probability of obtaining insider information and reliable stats was higher. However, bias was guarded against by interviewing officers who audit large, medium and small companies. The study aimed to interview at least one safety officer per site. Interviewing was ultimately used to over the survey method so that sufficient numbers of responses were obtained and answers were not left open-ended or incomplete. It was also realised that construction sites are extremely busy and it was a huge ask employees to adequately complete the questionnaires without any assistance and return them by a certain date.

Document Analysis: this was appropriate for the study because many accidents, by legislation, need to be recorded so there exist several statistics on the history of accidents and other work-related incidents, which may be evaluated. Several Statutes were alluded to but not evaluated; however, some of the content found therein was presented in the literature review with the pertinent data analysed in the analysis section. The data contained in these documents is highly reliable; however, the data is only as good as the data provided which may not cover a wide spectrum.

3.2 Data Collection

Data collection involves the use of selected tools and techniques to gather information, which will allow the hypothesis to be proved or disproved, (Knight and Ruddock, 2008). Several types of data collection methods exist and are applied to the research depending on what the study is aiming to achieve. The methods are detailed below:

Survey – This is information gathered by asking a range of individual the same questions related to their characteristics, attributes, how they live or their opinions, (Bak 2004: 47). This can also be done via means of an overview or observation. There are different types of surveys, which include descriptive, explanatory, census, cross-sectional, trend, panel study, face-to-face, telephone or self-administered surveys, Bak 2004: 47. "Pilot surveys" may have to be conducted to test the research instrument and ensure that the instrument will be effective in collecting relevant data. Surveys may prove disadvantageous when questions are answered correctly and the researcher may find him/herself having to conduct numerous surveys in order to generate credible answers. The researcher must counter against this by creating unambiguous questions and perhaps providing room for comment, if necessary.

Interviewing – Bak (2004:52) defines this method of data collection as a process, which involves researchers asking the respondents open-ended questions while taking careful note of the given answers. The different types of interviews include structured, semi-structured, formal, informal, one-on-one as well as group interviews. Alternatively, it is described as a purposeful conversation that is directed by one party in order to get information and thus proves useful in gathering qualitative data, Scheurich 1997: 48. There are disadvantages in choosing this type of method. The intended meaning and subsequent understanding may shift in numerous ways depending on time, place and situation, therefore requiring additional verification of the data obtained and the manner in which it is analysed. Bear in mind that the age, race, gender and class of the interviewer may also affect the interview itself as well as the results obtained from the interviewee, Mouton 2001: 87.

Observation – This method implies a systematic method of data collection and is reliant upon the researcher's ability to gather data via sensory measures. The disadvantages of observation as a research method include the bias the observer inflicts in the way the observer's observations are coloured; the impact their prior experiences, history, interests and biases may affect the true observations (O'Leary, 2004: 76). It is therefore vital that in analysing

observed data the processes of receiving, reflecting, recording and authenticating must be thoroughly orchestrated. The types of observations in existence include structured, semi-structured and unstructured, (O'Leary 2004: 77). Observation is extremely time-consuming for the researcher and the manner in which the researcher chooses to engage with the environment under observation can pose potential dangers. Some researchers may go 'undercover' and actually experience that which they are trying to study, in the actual environment. In this case, the researcher is fairly unprotected and actually tries their best to 'fit in' with the environment. Other researchers may choose to observe from afar and simply take notes. This method is relatively safe as the researcher can maintain anonymity and leave the situation whenever they wish. They are likely to be less emotionally involved but may also be unable to expose the true nature of events, or the influences on those events, as they view from afar, (Scheurich 1997: 60). Whichever method is chosen, the four processes mentioned above must be thoroughly adhered to in order to make the data reliable, (Knight and Ruddock, 2008).

Document Analysis – this is defined as "a collection, review, interrogation and analysis of various forms of text as a primary source of research data", (Bak 2004: 61). Like observations, this method is particularly susceptible to bias in that the author's and researcher's biases may alter the way in which the literature is read, written, understood and critiqued which could all make the data compiled from this method less reliable. The types of documents that can be analysed include authoritative sources, which are mainly in the forms of journals and tend to be less biased; personal communication in the form of letters and memoirs, which tend to be subjective and personal; multimedia such as DVD's, recordings, film and photographs; historical documents such as law books, archives and other published works.

For the purposes of this study, the descriptive survey-interview method was adopted, to gain an in-depth understanding of the problem and to ungulate, some of the responses received. In addition, research elements could be tackled, as they exist. Evaluation, with extensive feedback from participants who were already aware of the situation and to whom access was somewhat easily obtainable, then took place. The findings of the research were able to be deduced better as a larger sample size was obtained with which to work. The population was sampled from existing workplaces and the selection of the sample from that population was via random selection. A size of roughly seventy (70) participants was targeted for research

purposes. This meant an average of four sites and offices, with an average of fifteen participants each, were to be evaluated.

3.3 Data Analysis

Data may be analysed by means of statistics and data-analysis software, (Knight and Ruddock, 2008). The type of statistics used and the applied software must match the data and question types. The software included in the report was Microsoft Excel. Types of statistics include descriptive and inferential statistics. Descriptive stats are mainly used with quantitative data as a means to provide measures of central tendency. Inferential stats 'is about conducting statistical tests that can show statistical significance', (Steyn, Smit, Du Toit and Strasheim, 1994:49). Depending on the type of data and subsequently method of statistics used, different scales of measures were used in this research to evaluate the obtained data.

The data analysis method used in this paper combined statistical methods and qualitative analysis. The questionnaires were grouped according to interview groups, namely managers, safety officers and labourers. The question numbers and answer options were recorded on a spreadsheet. The use of the computer programme, Microsoft Excel, enabled the results to be tabulated and graphed for representation. Where singular or unique answers were given, which were not allowed for the in programme, notes were made and the statements were used to deduce the findings.

Chapter 4 – Results and Findings

4.1 Introduction

This chapter presents the data that was found as well as provide a description on the observations and variances found in the analysis of the data. Three companies were selected to data collection. One of the companies, Stefanutti Stocks could not be used for data collection as no interviews could be finalised. This ended up working out for the better, as the three companies that were finally used were three completely different companies, which allowed for a better analysis and subsequent comparison when trying to find the norm of H&S practices in construction companies today.

Murray and Dickson (M&D), Tyris Construction (Tyris) and Wilson Bayley Holmes Ovcon (WBHO) were the three companies used for data analysis. M&D is a small to medium sized construction firm based in Bryanston and employing less than 150 employees. The company handles commercial projects ranging in size from R25 million to R180 million. Interviews were conducted at the company's John Moffat site situated on the east campus of the University of the Witwatersrand. The site has a project value of R45 million.

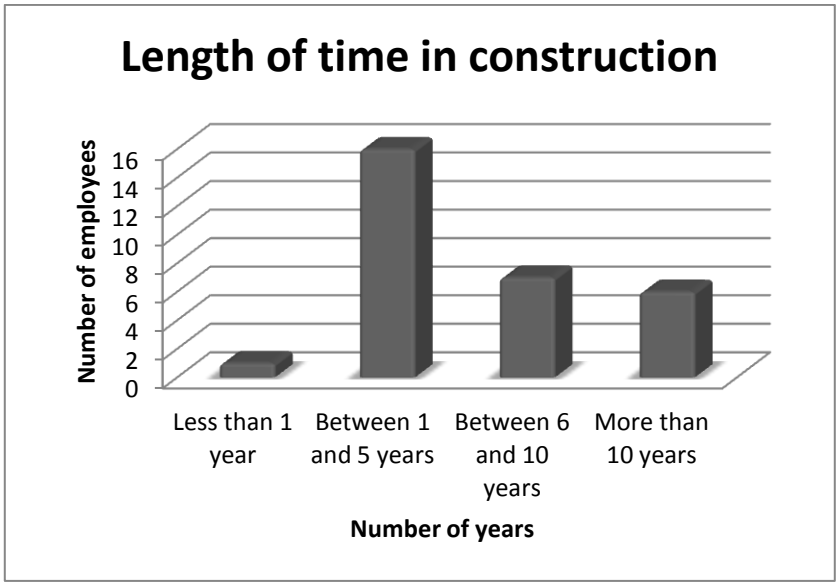
Tyris is a Pretoria-based medium-sized firm. It employs between 350 and 500 employees. The site used for interviews was the Wits Public Health Building situated at the University of the Witwatersrand's Parktown campus. The site has a project value of R200 million. WBHO is a multi-disciplinary company based in Wynburg and employs over 1000 employees. The company operates within different provinces within this country as well as in other countries. The site used for the interviews was Menlyn Maine Phase 2 in Pretoria. The site has a project value of R280 million.

4.2 General workforce interview

The first group to be interviewed was the labour-force, herein referred to as workers. This employee group contains workers of differing skill and educational levels. Various ethnic groups are also found within this group is shown later in the analysis. This group is remunerated on an hourly basis.

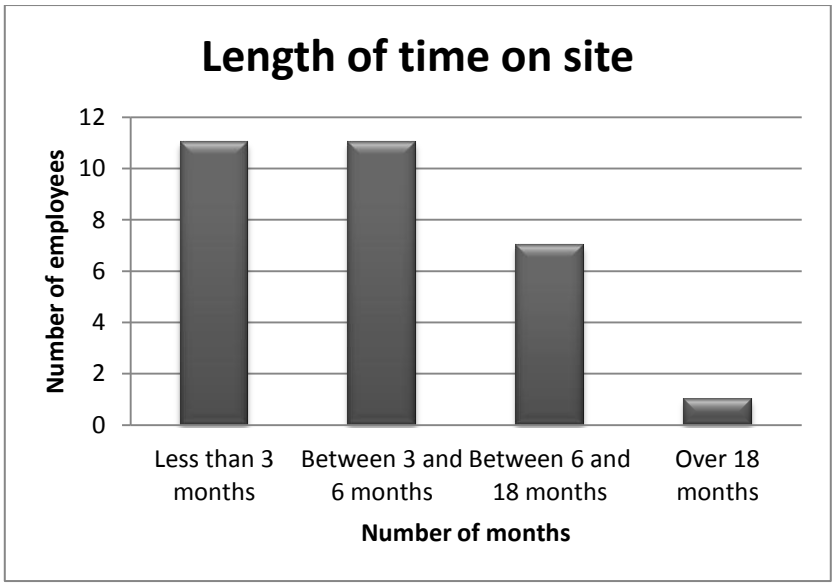
4.2.1 The first part of the interview focused on their level of experience within the construction industry, as well as within their companies. One fresh-faced employee had recently entered the industry after completing his Business Administration diploma at a college. He had struggled to find employment in the corporate sector and was forced to take any other job he could find, which happened to be within the construction industry. Over half of workers had entered the industry either from high school or from the engineering sector. Several workers had been in the industry for over twenty to thirty years.

Figure 2.1: Length of time labourers had been in the industry



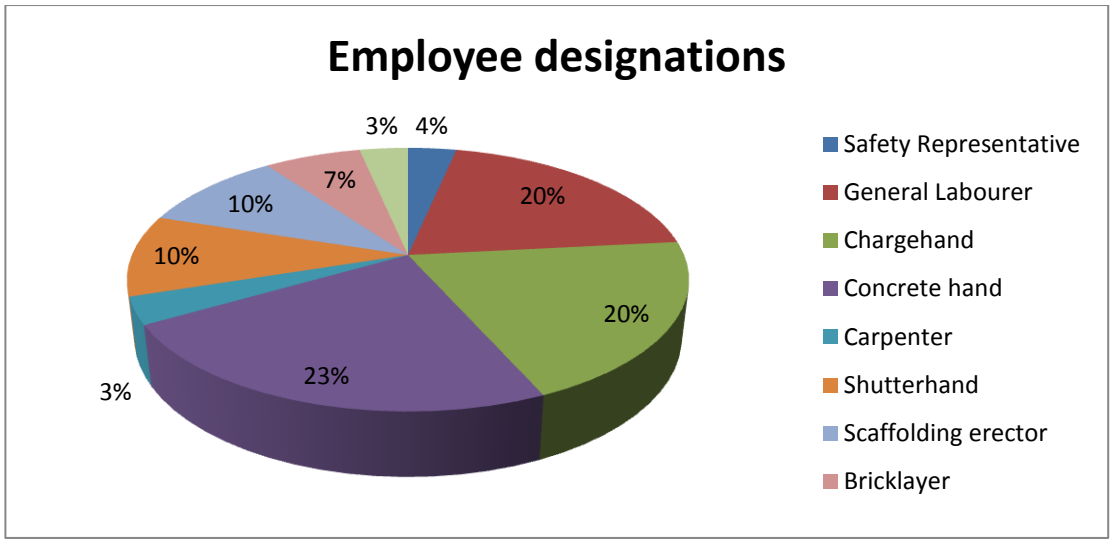
Over seventy percent of the workers had been brought to their current sites when their old sites had reached completion. Only twenty-four percent of workers had been on their current sites since the commencement of these sites. This had been due to the large amount of bulk-excavation work being done by specialist subcontractors at the commencement of those sites. On completion of the bulk excavation works, skilled chargehands, supervisors and foremen were brought to the site to begin setting out. As such, the majority of workers only arrived on site roughly three months after the commencement of the site.

Figure 2.2 Amount of time workers had been on site



4.2.2 The next part of the interview looked at worker job-designation, which ranged from unskilled positions to skilled chargehands and safety representatives. The construction industry had taken a huge knock following the hosting of the 2010 Fifa World Cup. With companies experiencing decreased workloads, many workers worked out of position. This was also influenced by company re-structuring which created uncertainty. As such, when instructed to perform set tasks, few workers would argue for fear of losing their jobs. Though many workers were unhappy with their "new" job designations as they felt that had been demoted, two employees had received training for new job roles and had subsequently been promoted.

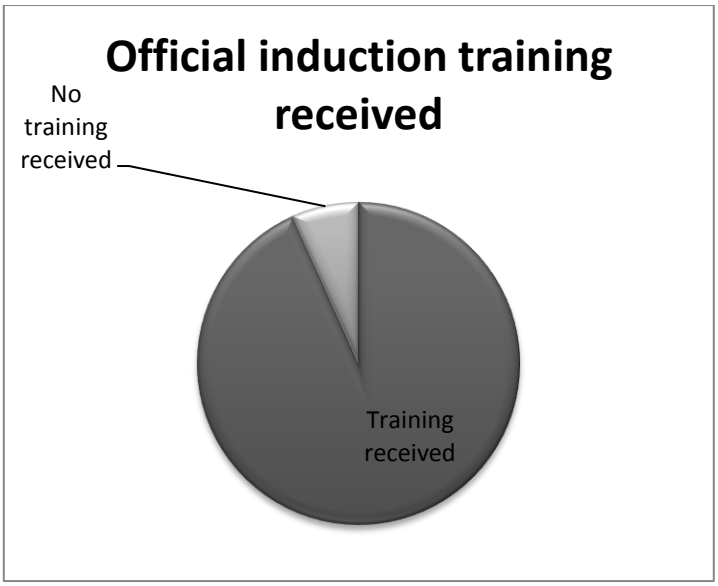
Figure 2.3 Worker job designations



4.2.3 This part of the interviewing focused on company site induction. Ninety-three of workers had received official induction training upon their arrival on site. The two workers who had not received induction training stated that they had been transferred from nearby sites well into the commencement of their current sites, which they felt was probably the reason why they had not received induction training. They further stated that they had been working in the industry for a number of years and did not feel it necessary to undergo the same induction training they had received numerous times before.

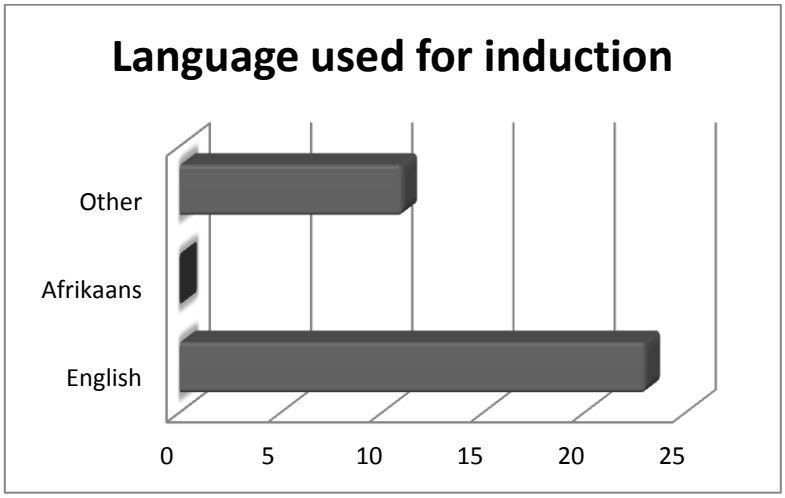
This sentiment was rather disturbing to hear given the amount of time taken to conduct induction training and the possible savings, which would result there from. Induction training was likely to take between thirty minutes and one hour. The implications of not doing induction training could have been severe. Should it have been found that an injured worker had not received induction training, the company could have been held liable for the worker's medical costs for life, and the company would not be able to recover that money from Workman's Compensation. The company could also have been legally liable for failing to protect its employees. That companies were willing to take this risk seemed irresponsible.

Figure 2.4 Official Induction Training received



English was the primary language used in induction training, however, proactive companies were utilising their safety representatives to conduct induction training in vernacular languages. With the great number of languages spoken by site workers, safety representatives resorted to using the two more popular vernacular languages spoken in their regions, which was often isiZulu and Setswana, when conducting induction training. This did change according to the region whereby one company even conducted induction training in Shona due to the number of Zimbabwean nationals working on the site.

Figure 2.5 The language used during Induction Training

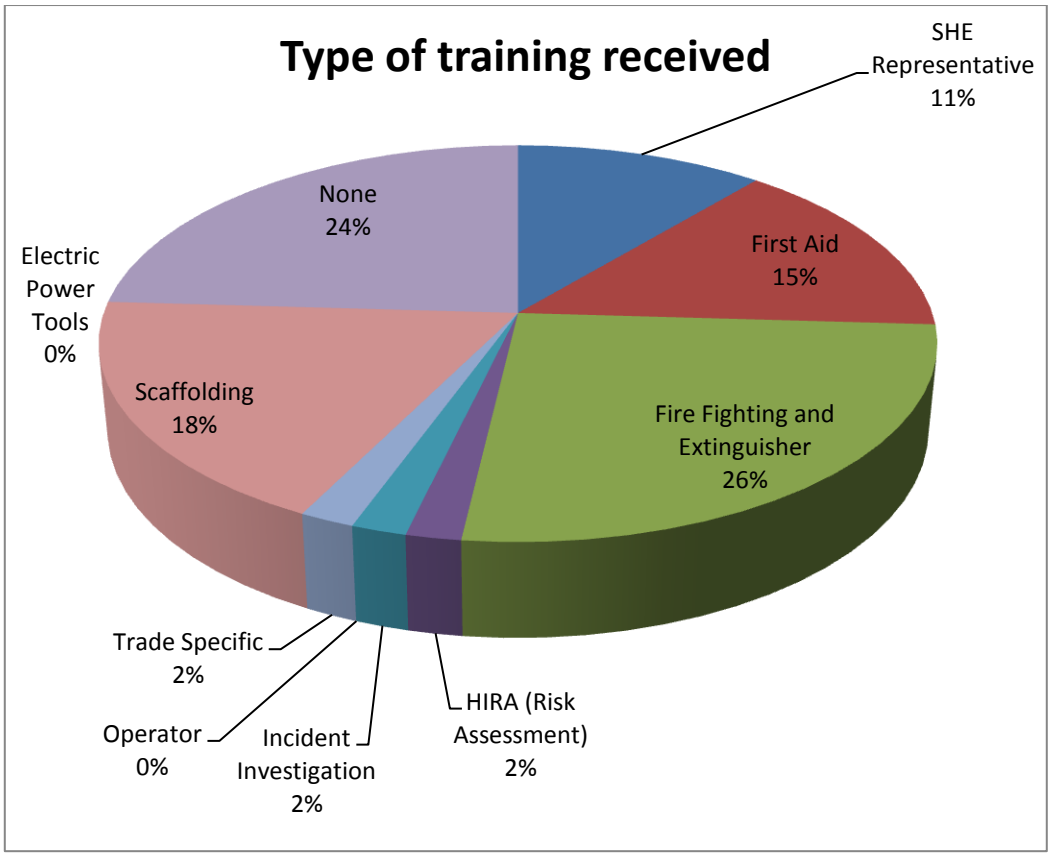


When it came to ensuring that workers understood the topics covered during induction training, one company, WBHO, printed booklets containing the major rules of the site. The book was printed in English but also contained many pictures, which the workers found useful and practical as the site progressed. Other companies relied on informal interviews and the use of stickers to ensure that workers understood the material presented during induction training. None of the companies made use of the written-test method and six percent of workers mentioned that their understanding had never been tested. They admitted to receiving training in English and then being assigned tasks on site.

It was encouraging to observe that cultural diversity on site was being acknowledged and that companies were trying to accommodate more workers by conducting induction training in more languages.

4.2.4 This part of the interview reviewed the training that took place. Seventy-six percent of workers had received some form of safety or job specific training. This training ranged from First Aid and Fire Fighting to Scaffolding and trade-related training such as wet-trades and carpentry short-courses. Those who had not received training were mainly general workers or workers in highly specialised designations where re-certification was required every few years.

Figure 2.6 The types of training received by workers



An interesting observation was that some of those who had received training either felt their training was too basic and would have preferred more technical training, or, they did not want any training at all. Those who did not want training mentioned that upon their return to work from training, they were not given the opportunity to apply the skills they had been taught thus felt the training exercise was fruitless. Those who did not receive any training at all felt they had been sidelined or that their companies were preventing them from taking "Trade Tests" as their professional qualification would have forced the companies to pay them higher wage-rates. When asked why they had not taken it upon themselves to register for Trade Tests themselves, they mentioned that the tests were expensive and that they required time to be taken off during working hours; hours they would have been compensated for since they were hourly-wage workers.

4.2.5 This section focused on safety practices on site. The most common method of ensuring that safety policy was followed on site was via the use of Toolbox Talks. All three companies

conducted regular toolbox talks. A topic was chosen for that particular session and discussed at length during the talk. Other methods of safety reinforcement included safety-related training; enforcing the wearing of full PPE; suspensions and/or disciplinary hearings for any safety contraventions. Employees at M&D mentioned that they had been forced to wear reflector jackets on site but since university students walked freely around the perimeter of the site, the workers did not want to bring too much attention to themselves and opted to stop wearing the jackets. Their actions had not resulted in any warnings or penalties thus they had continued not to wear them.

Toolbox Talks were done on a weekly basis at both M&D and WBHO. Tyris took it s step further and conducted the talks on a daily basis. All three companies have disciplinary hearings or suspensions for workers who contravened rules; however, these practices only occurred once the actual contravention had actually taken place.

Seventy percent of workers were fairly aware of their safety policies. Tyris and WBHO had their safety policies displayed around their safety officers' officers or meeting areas. The policies were transcribed in English, which made it difficult for a large number of workers to fully read or comprehend, however, there mere display of the policy allowed for easy reference at any time. The workers further stated that their policies had been briefed to them during induction training. A recommendation from both groups was for the policies to be transcribed into one or two vernacular languages too as this would enable them to understand the policies better and play a more proactive role in the management of health and safety. M&D workers were not aware of what was contained in their company's safety policy. One M&D worker was assigned as a safety representative. Given his designation, he had been exposed to the company's safety policy on various occasions.

Figure 2.7 Employee knowledge of company safety policy

When the workers were asked what their roles were on site, with respect to health and safety, eighty-three percent stated that they were responsible for caring for their colleagues' health and safety, as well as ensuring that they worked safely. As such, they took on this responsibility role rather seriously. Ten percent of the workers were safety representatives and stated that they were responsible for all health and safety matters on their sites, as they operated as deputies to their safety officers. Twenty-seven percent of workers found that they did not have specific health and safety roles but that it was their duty to listen to supervisors and obey rules. Ten percent of workers felt they did not have any particular role to play on site as the safety officer, safety representatives and senior supervisors, had assumed this role.

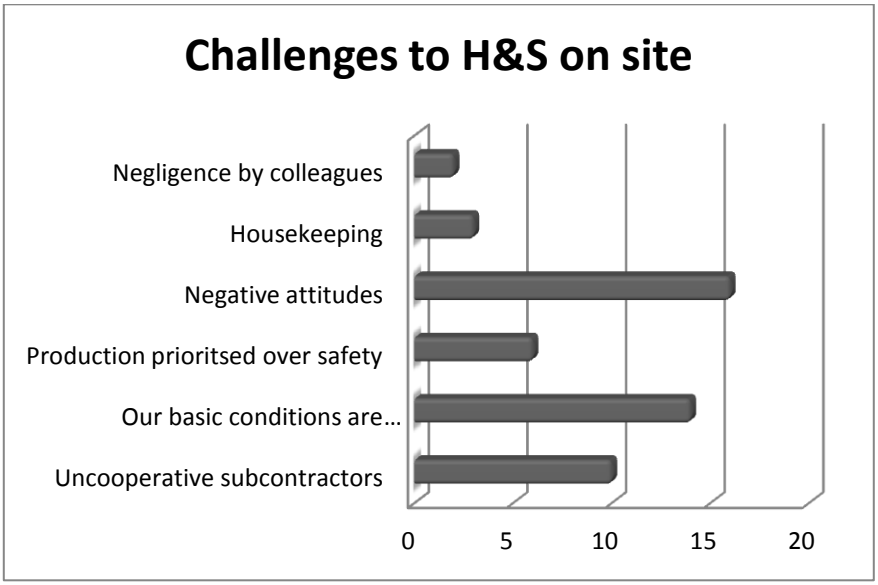
Ninety-three percent of workers felt that safety was taken seriously or very seriously on site with only seven percent arguing otherwise. This seven percent justified their argument by stating that double standards were applied to the manner in which contraventions were handled thus casting doubt on the seriousness in the manner in which health and safety was handled. Furthermore, they had lost a sense of respect for their managers who always preached safety yet completely disregarded it when productivity levels needed to be at an all-time high.

4.2.6 This final section looked into the health and safety challenges workers encountered on site as well as solutions and suggestions they proposed in order to overcome these challenges.

Over half of the workers felt that negative attitudes shown towards health and safety by their colleagues, managers and subcontractors were the biggest challenge. Just under half of the workers felt their working conditions posed the biggest challenge. Workers elaborated by stating that they were often forced to work in the rain without any raincoats being provided for them; they were often working on site without any toilet facilities or with dirty and unhygienic toilets; they often did not receive adequate healthcare for their injuries unless their injuries were serious to the extent of warranting hospitalisation. One of the biggest grievances was that they often had to work while sick or else they would not be remunerated during their absence, unless they had received notices from "white" or Western doctors.

More challenges which were mentioned included the regular contravention of safety regulations by subcontractors. They reported that subcontractors were particularly bad with housekeeping, which imposed a number of hazards. Stubborn colleagues could also be careless which also created a challenge, however, the continuous badgering of such colleagues to get them to listen and change their ways often resulted in a worthwhile improvement.

Figure 2.8 Challenges faced by workers to site health and safety



Workers stated that such challenges could occur at any time thus forcing them to be alert at all times. Thirty percent of workers felt that when subcontractors started arriving on site in their numbers, these challenges arose more often. When such challenges arose, seventy

percent of workers reported the matter to their safety officers with the remainder opting to inform a foreman or superior in charge of the site. One worker stated that he opted not to inform any person, as he did not know whom to report to or whether his complaint had any merit.

When questioned how challenges should be handled, almost all mentioned that communication needed improvement across all levels. Between fifty and sixty percent felt that penalties such as fines and dismissals should be imposed on for any contraventions. Fifty-seven percent felt increased training should be scheduled. Between twenty-seven and thirty percent felt their job tasks needed to be relative to their designations and that this could be done by ensuring better planning on site. This would also have minimized incidents, as workers would have been doing work known to them as opposed to undertaking tasks unknown to them.

Reliability of data collected:

The Cronbach alpha (α) figure obtained for this set of questionnaire answers was 0.68. This means that thirty-two (32) percent of that data is unreliability. Despite this minor unreliability, to obtain such a strong correlation across 3 different focus groups, means that the data collected from these questions (as per the interview) proves significantly reliable for this research.

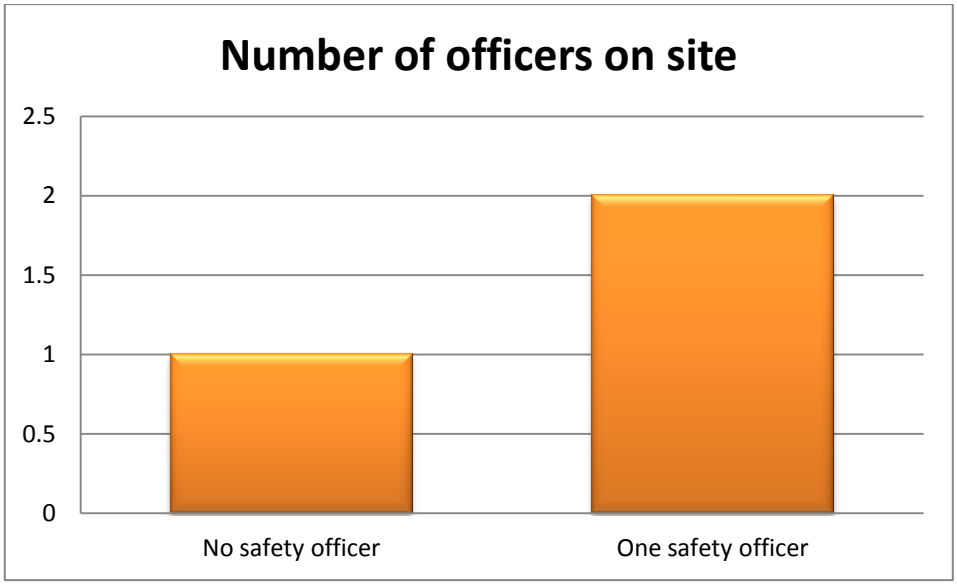
4.3 Safety officer interview

The second group to be interviewed was the safety officers. Safety officers are often referred to as safety facilitators on sites. It is deemed that they are the most knowledgeable about safety legislation and practices on site. It was with this background information that the safety officers were interviewed.

4.3.1 General questions were posed to determine their suitability, or rather, capability, for the job. All three safety officers attained safety-related diplomas. Safety courses were not offered at traditional tertiary academic institutions and remain so thereby compelling the officers to undertake their studies at technikons, colleges or private institutions. Tyris and WBHO each had one safety manager per site while M&D had one safety officer within the entire

company. A number of safety representatives were appointed per company per site. The M&D safety officer often felt overwhelmed by the amount of work assigned to him but reasoned that the size and number of sites within the company, as well as the appointment of safety representatives, made safety management more manageable.

Figure 3.1 The number of safety officers per site



One safety officer had been on his construction site since its inception. Another had started on site one month after its commencement as he had been finalising documentation at another site. The third officer was the only officer without a permanent site as he was the only officer within his company. He therefore travelled from site to site.

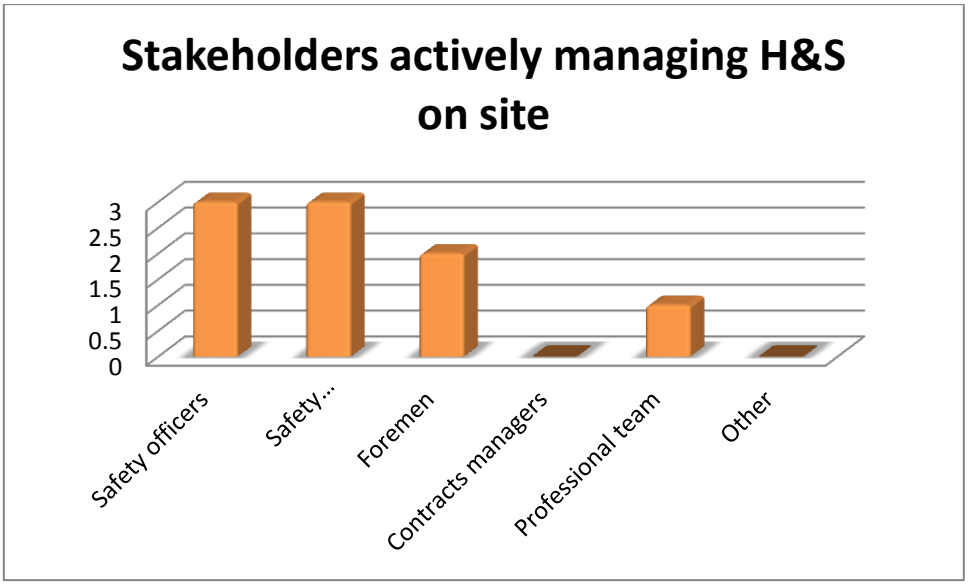
4.3.2. In terms of previous site exposure, one safety officer said it was assumed everyone had been exposed to site conditions before, except students who only came to site for short periods during the holidays. This was the assumption of the same officer who felt overwhelmed by work. The other two officers shared the view that previous site exposure did not matter and that every person who had arrived on site had undergone compulsory induction training before doing any work on site. It made no difference how insignificant their work seemed, all individuals had to undergo induction training upon their arrival on site.

4.3.3 Safety planning was done at the commencement of all three sites. At two companies, a standard safety policy was modified to suit current conditions. At one site, Wits Public

Health Building, the safety plan was created from scratch in accordance with client specifications. The plan was further amended by the safety officer, when the site began, so that the plan was site specific. In terms of updating the plan, one site safety plan had never been updated; another was only reviewed or investigated if an accident took place; while at the last site, the plan was reviewed yearly or when the scope of work changed.

The active management of health and safety on site was done by the safety officers and safety representatives. Two officers added that foremen assisted in safety management too, however, their focus lay mainly with production, which was where their priorities stood. One officer argued that the professional team was also active in managing safety. He noted that they were often the first ones to spot the majority of safety contraventions and reported them immediately, either during weekly meetings or via email communication. There was a consensus that management was not involved in the active management of health and safety matters on site.

Figure 3.2 The stakeholders actively managing health and safety on site

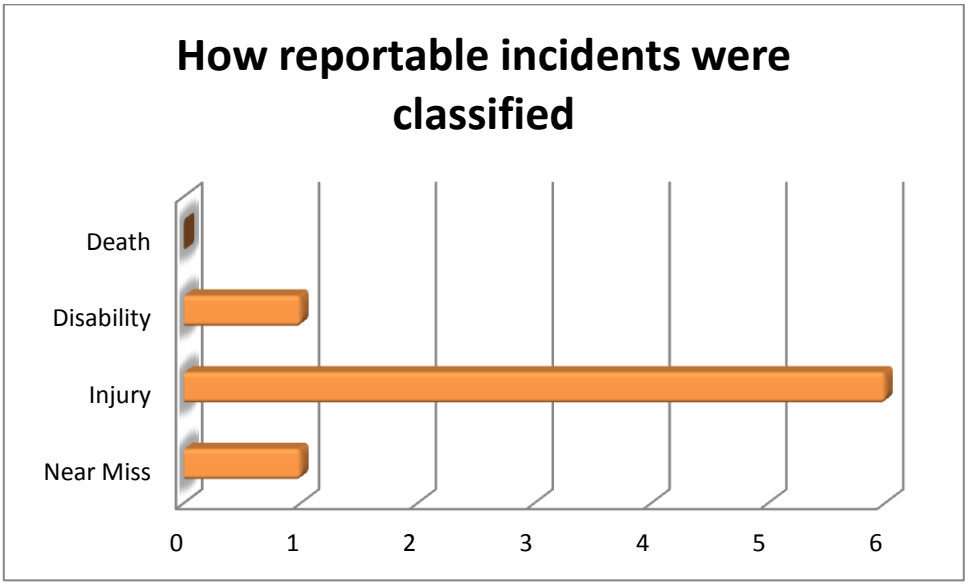


In terms of the manner in which health and safety was managed, different yet similar systems were used at the different companies. WBHO used a combination of DSTI to report on work, method statements and risk assessments to plan the work. Tyris used site inspection reports to report on work, and registers and risk assessments to plan work. The safety officer also had to submit a number of reports to the company's head of health and safety management on a

monthly basis. M&D used monthly safety meetings with safety representatives and subcontractors to discuss the management of health and safety matters affecting the site. All three companies used daily or weekly toolbox talks. Toolbox talks were used as a platform to address pertinent health and safety items, reinforce items that were seen to be slacking or to report on incidents that had occurred on site as well as the cause of those incidents.

4.3.4 The interviews then progressed to the number and nature of incidents that had occurred on site. Two of the companies had reported between one and five incidents. It was explained that where any injury required the worker to take time off work to receive treatment or undergo recovery, was deemed a reportable incident. One company had recorded seven reportable incidents although half of these had taken place with subcontractors' workers.

Figure 3.3 The classification of reportable incidents



Three-quarters of the incidents reported were classified as injuries. As such, the injured workers required hospitalisation (minor treatment) and were booked off for up to fourteen days before returning to work. Thirty percent of incidents were classified as near-miss incidents, which meant workers, were injured but only required first aid attention before returning to their tasks. Twenty percent of incidents were classified as disability incidents. These workers required urgent medical attention, recovery (i.e.: time off work and the submission of progress reports until they were fit for duty) and were likely to return to work

more than twenty-one days after being injured. None of the three companies reported any incidents which resulted in death.

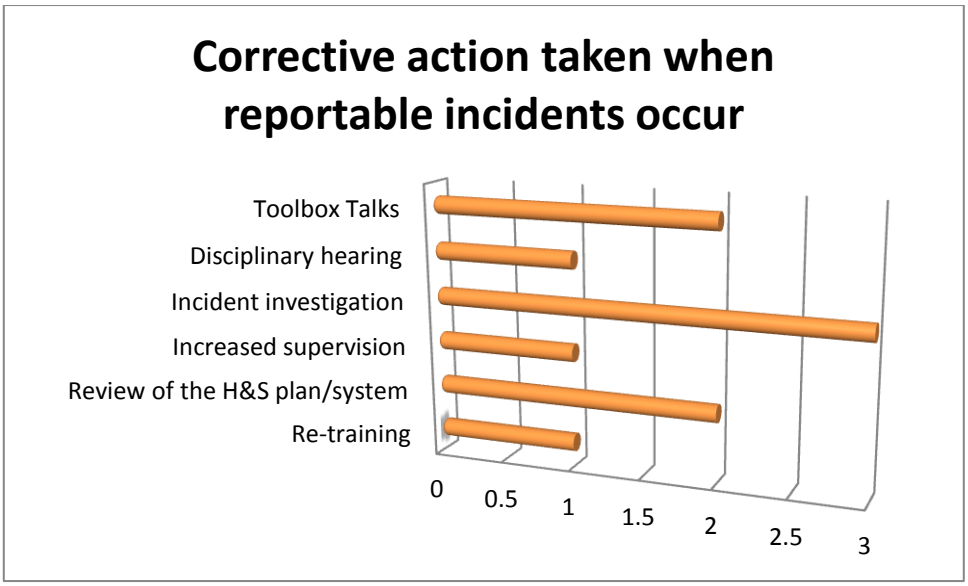
The cause of the incidents was mainly attributable to lack of communication; work taking place at heights without the wearing of adequate PPE and, inadequate risk assessments for certain tasks. The safety officers found that the wearing of inadequate PPE was easy to correct and also easy to punish. Training seemed to resolve the incidence of inadequate risk assessments being completed. Lack of communication proved difficult to resolve as it required the buy-in of all individuals on site and needed to be applied consistently. Another cause of incidents was poor housekeeping by both the principal contractor and subcontractors. This was a relatively easy contravention to correct however, needed to be applied constantly.

Two of the companies sought to recoding injury-free periods. These periods were counted in days or working hours since the last incident had occurred and were posted around site offices for all workers to see. Tyris stood at 300 injury-free hours while WBHO stood at 150 injury-free days since the last incident had occurred. It was explained that the display of these hours motivated workers to commit to actively managing their own health and safety on site, which often lowered the incidence of incidents.

The data suggested that the majority of incidents took place as subcontractors arrived on site. This further suggested that the more people there were on site, the more difficult the monitoring and management of health and safety became. The third company took a somewhat opposing view and stated that incidents took place at any time. As such, systems needed to be kept updated in order to deal with the incidents as they occurred.

4.3.5 When taking action once the incidents had occurred, all three companies undertook incident investigation. Thereafter, the incident was discussed in great detail at a toolbox talk. One company, Tyris, went beyond the normal toolbox talk by conducting additional incident reporting, referred to as a Flash Record. Details and assessments of the investigation were analysed and communicated to the workers who then signed for the attendance and understanding of the session. Other interventions used included disciplinary hearings, increased supervision and risk assessments. Where it was found that the worker was inadequate in performing the task, at no fault of his own, the worker was sent for training or re-training in order to increase his/her skill level.

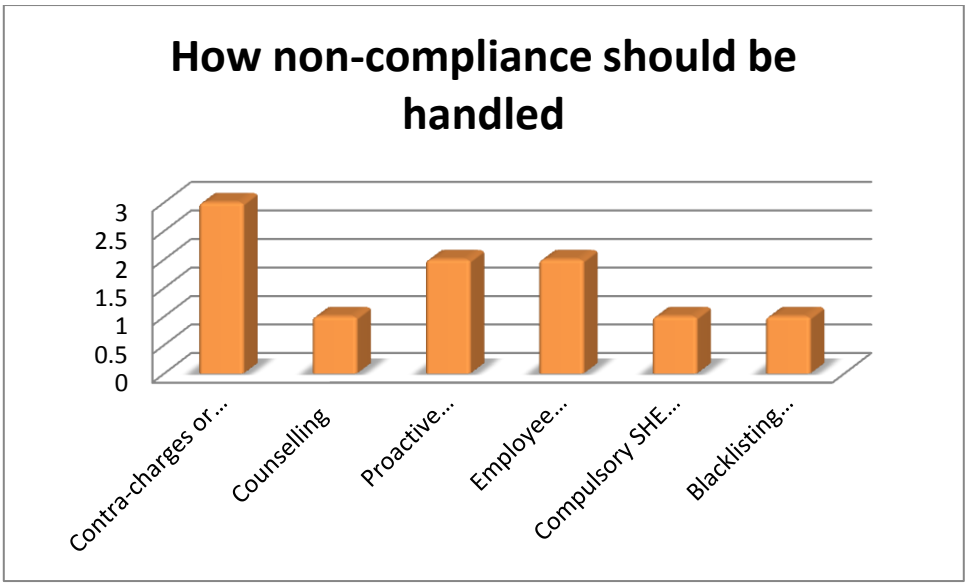
Figure 3.4 Corrective action methods used once reportable incidents had occurred



Taking corrective action with subcontractors took a slightly different approach. Principal contractors allowed subcontractors to take charge of their own health and safety. They were responsible for registering their own workmen's compensation, appointing health and safety representatives and conducting their own incident investigations. Furthermore, subcontractors were responsible for conducting their own disciplinary hearings and toolbox talks and had to furnish proof thereof. What the principal contractor was then able to do was penalise subcontractors by issuing non-conformance reports (NCR's) and fining or contra-charging subcontractors.

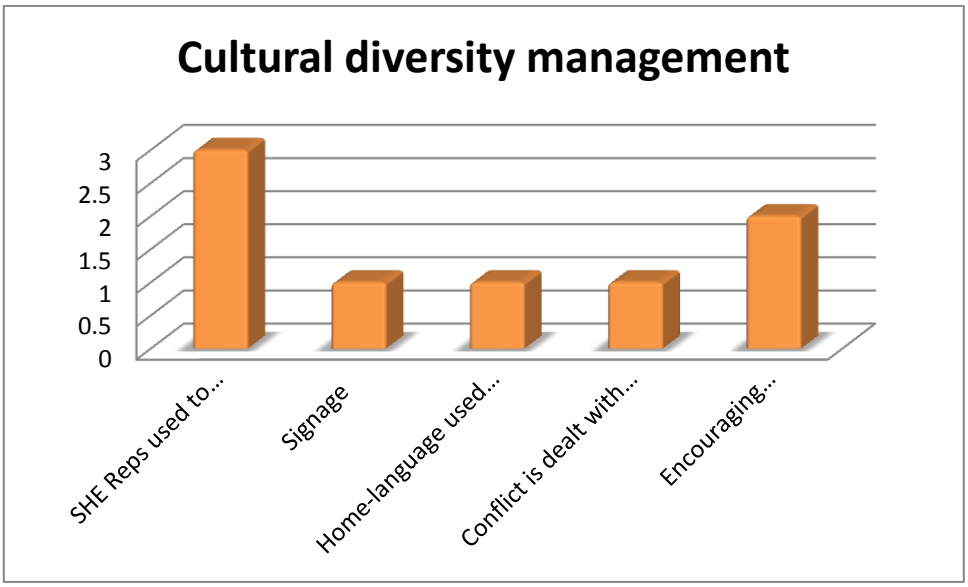
When asked whether the manner in which subcontractor non-compliance was being handled could be improved, all three officers stated that fines worked quite well. They elaborated that the moment the subcontractor became aware of potential money flowing out of his/her pocket, health and safety management was prioritised. It was added that increased subcontractor supervision on site also helped minimise safety contraventions, and on the local front (for principal contractor workers), unpaid suspension worked well. Other initiatives which were suggested included the compulsory appointment of safety representatives for all subcontractors; counseling sessions for workers who had contravened safety regulations and, blacklisting subcontractors with repeated contraventions thereby making it more difficult for them to find work.

Figure 3.5 The handling of non-compliance



4.3.6 The interview moved to the topic of cultural diversity on site. All three officers were aware of the vast cultural diversity on their sites. It was also noted that two of the officers were Black while the third was Coloured. They acknowledged that their race made it easier to interact with workers as they had a knowledge-base of a number of languages.

Figure 3.6 Cultural Diversity Management



All three officers stated that having skilled Black safety representatives made their jobs easier in facilitating communication to the workers. The safety officer at Tyris stated that one of his safety representatives was White and battled to communicate with the workforce. As such, he was not used much for verbal communication but was able to assist in posting signage and compiling reports, which did not require much interaction with the workforce.

The data indicated that language was the biggest obstacle to the understanding and subsequent management of health and safety on site. Differing education levels and the prioritisation of production over health and safety ranked as the next biggest obstacles to health and safety management. Differing ages of workers and a lack of interest from management also came up as obstacles to health and safety management. Officers proposed increased interaction between various groups on site and placed some responsibility with the foremen to choose diverse working teams and foster communication. It was pointed out that communication was affected by production and that individuals communicated in condescending or unclear terms, which resulted in miscommunication. As such, any conflict had to be handled with immediate effect. A greater involvement from management was also encouraged.

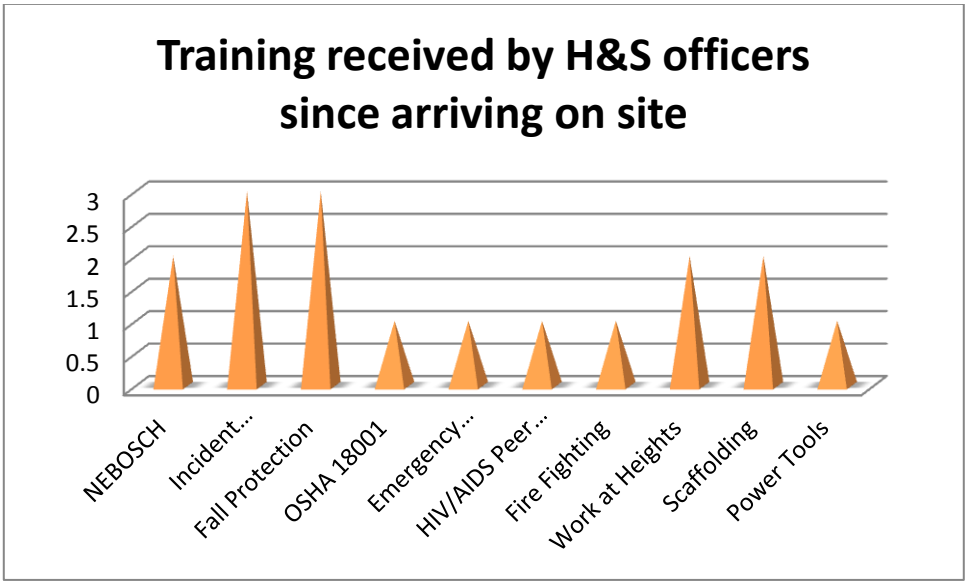
Safety representatives and management met to discuss health and safety management on a monthly basis. Preliminary meetings often resulted in little input from safety representatives, which often frustrated the workers. Over time, safety representatives' confidence levels grew and they were able to fully participate with management and represent their workers.

4.3.7 Responsibility for health and safety matters was vested mainly with both the safety officers and management. One safety officer shared dual responsibility with the project manager who represented the client while the other safety manager shared dual responsibility with his management team (CEO of the company). One safety officer stated that he was solely responsible for all health safety matters on site and had been required to sign a disclaimer making him responsible for all health and safety matters regarding this project. Surprisingly, this was the safety officer at Tyris, which could explain why he seemed the most proactive of all the safety officers.

4.3.8 The interview concluded by once again checking whether the safety officers had received courses to ensure their growth and capability to do the job. The question posed

tracked the amount of training the officers had received since arriving at the site, or in the past 12 months.

Figure 3.7 Training received by safety officers



All three officers had received Incident Investigation and Fall Protection training. It was justified that these courses were necessary for any site as accidents could occur at any time and were likely to, (and more serious when) they occurred at heights. Furthermore, the officers needed to be reminded of any legislative changes affecting the reporting of incidents or the cover the company would be liable for, thus consistent training enabled them to stay updated. Both the officers at WBHO and M&D had undertaken the NEBOSCH course, which was a requirement for their careers. The officer at Tyris had been sent on the most number of courses and was also registered with professional bodies as safety coordinator, a safety practitioner and a safety auditor.

Reliability of data collected:

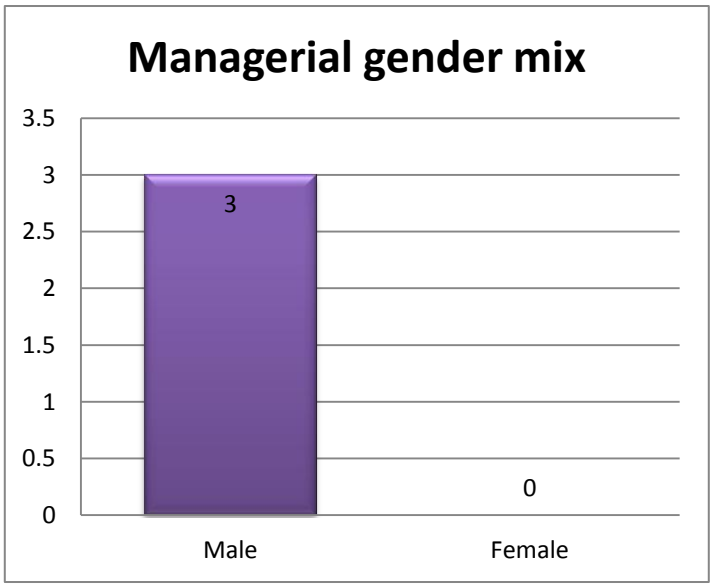
The Cronbach alpha (α) figure obtained from this set of questionnaires was 0.71 indicating a twenty-nine (29) percent unreliability factor. The correlation between the three companies is strong thus the data obtained for this research is significantly reliable.

4.4 Management interview

The final group to be interviewed was management. Individuals represented mid to executive management levels within their companies.

4.4.1 The interview began by obtaining personal and demographical information about the managers. All three managers were White males who had at least a degree from a traditional academic institution. This profile matched the demographics noted by the State years ago when they drafted the Employment Equity Act of 1998, which stated that the majority of managerial positions in most industries throughout the country were occupied by White males. The Broad-Based Black Economic Empowerment Act of 2003 in conjunction with the EEA were introduced to make the country's workforce profile more representative of the country's overall demographics. This meant that Black groups (African, Coloured, Indian and Chinese) were to be given greater opportunities to participate in the workplace and at managerial levels. The Construction Charter of 2009 was created specifically for establishing equity and boosting skill levels within the industry.

Figure 4.1 The managerial gender split



From the data collected it is apparent that the rate of transformation at managerial level within the construction industry remained unchanged from years and decades ago. This could

be attributed to the skill/s required for this industry, which are largely gained through experience.

The managers' experience within the industry stood at mid-career level with the majority of respondents having acquired between six and ten years industry experience. The relevant Acts had been in place for thirteen, eight and two years respectively thus it was disappointing that no Black (African, Coloured, Indian and Chinese) representation was evident within the managerial ranks at these companies, given the number of Black employees within the companies' structures.

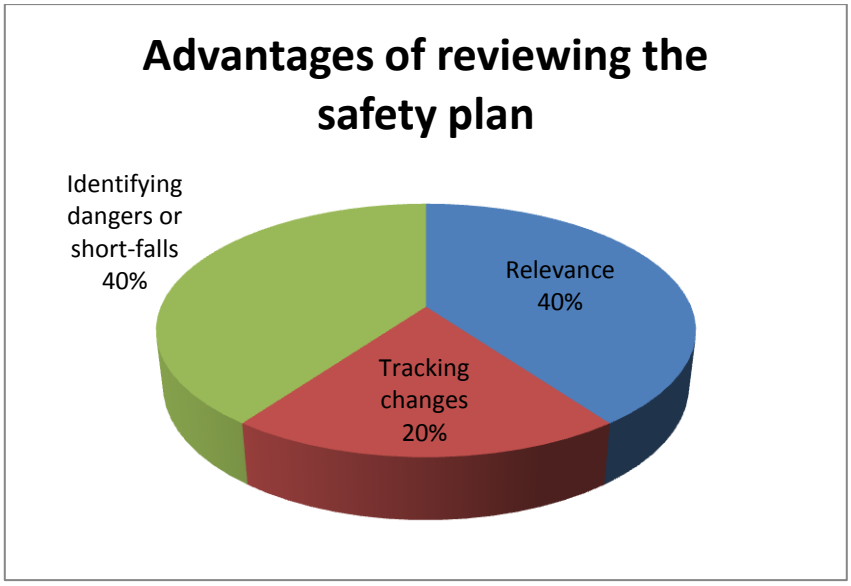
The interviews were conducted with a Senior Site Engineer, a Contracts Manager and a Project Manager, the Project Manager being the one with the most years of experience amongst the three and the Senior Site Engineer being the only one stationed at one site. None of the three was professionally registered with any Body. All three stated that this industry valued experience over qualification thus had never felt the need to qualify professional in any discipline.

4.4.2 The focus of the interview shifted to management's involvement in safety planning. Two managers had no involvement in the formulation of the safety plan for their sites. This was attributed to the appointment of safety officers and company directors who were responsible for this section of the projects. They did not state that they were not responsible for safety in any manner but that their responsibilities regarding safety were not significant. The manager at Tyris stated that his involvement was due to the fact that he was an executive member of the company and was ultimately responsible for all health and safety matters taking place on site. He did mention that his involvement had waned somewhat since tendering stage.

In terms of implementing the safety plan on site, two of the three managers stated that they had been involved. The one manager had a hands-on approach due to the size of the company and the fact that there was only safety officer in the company. The other manager's involvement was more of a supporting role. The final manager's involvement was very minimal as there were a number of parties in the company, ranked higher than him, who took on that responsibility. These were the safety officer, the site agent and the contracts manager.

Two of the managers stated that the safety plan was reviewed at undetermined intervals. The plan was either reviewed per project or on an annual basis. The safety plan at Tyris was reviewed twice a year as the client continued to change project specifications forcing the plan to be updated regularly to ensure its adequacy and relevancy.

Figure 4.2 Advantages of reviewing the safety plan



The advantages of reviewing the safety plan were that unperceived dangers or revised shortfalls could be tracked and planned against; any scope of work, trade-related and resource-related changes could be tracked and be accommodated into the plan but the biggest benefit was that the plan remained relevant. One manager did argue that continually reviewing that safety plan could lead to complacency as workers would hear the same message and resort to not taking health and safety as seriously as they should.

4.4.3 The interview zoned in on communication. The type of communication used on site varied from company to company. One company, M&D focused primarily on written communication, from a management point-of-view. Another company, WBHO, relied more on verbal communication while the third company, Tyris, used a combination of written and verbal communication. M&D argued that they were not well versed at vernacular languages and with there being only one safety officer in the company, written communication proved a far easier form of communication. WBHO had a safety officer and a number of safety representatives on site who were efficiently versed in English and vernacular languages.

Verbal communication was a far quicker way of relaying information to the workers. Tyris had a similar argument to WBHO but insisted that written communication assisted in reinforcing health and safety messages.

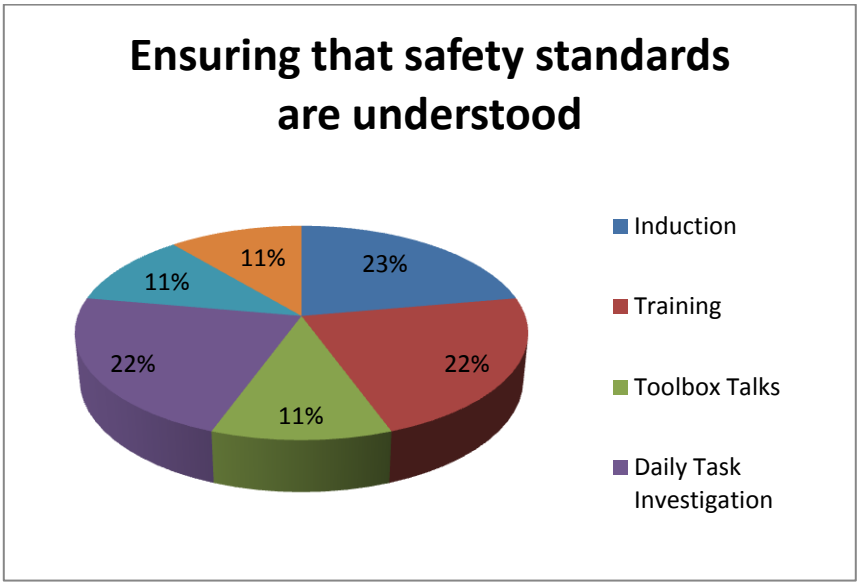
English is known as a universal language. The question was posed whether the use of English dominated communication on site. Two companies stated that English and another language/s dominated the communication. At WBHO, English dominated with vernacular languages. The safety representatives accommodated the workers by translating most health and safety related aspects and by encouraging employees to complete their risk assessments in their home languages. These risk assessments were checked by the safety representatives. At Tyris, English and Afrikaans dominated most discussions based on health and safety. The company is based in Tshwane where the majority of the population communicated in Afrikaans as opposed to English, including the workforce was also well-versed in Afrikaans. These were the main languages used on site. M&D's communication was mainly in English. The manager stated that he did not understand vernacular languages nor did he know Afrikaans. As such, his communication was always in English and he preferred for workers around him to communicate in English. The company had recently resorted in taking a large number of employees to adult school. The workers received Adult Basic Education and Training (ABET) which assisted them in improving the literacy and numerical skills, which then aided their communication with management.

In terms of ensuring that every person on site understood safety standards and practices, the managers insisted that they were not in charge of this aspect. This was managed by safety officers and representatives. These groups were also mandated to ensure that the general elements and individual job-specific elements of safety standards were understood. The managers could only refer to the safety policies and manuals when listing the following items as components, which helped clarify standards and practices:

- Induction – every worker received induction training before they commenced any work on site.
- Training – where workers were scheduled to take on new tasks, they were sent on training courses. Courses were not only trade or job specific. Workers were also sent on general and specific health and safety courses.

- Companies made use of Daily Task Investigations (DTI's) when planning activities for the day or the week where all hazards were identified and resolved before the task began.
- Other methods included Toolbox Talks, Risk Assessments, the communication of safety plans and standards and the forced attendance during such communication or talks. Failure to attend these communiqués and talks would result in penalties.

Figure 4.3 Ensuring that safety standards were understood



4.4.4 The managers were then asked how non-compliance of safety standards was handled for subcontractors. The most popular method, as utilised by all three companies, was the completion of Non-conformance Reports (NCR's). These were logged into the project's records and had different implications for individuals and subcontractors. Subcontractors were fined for each of their employees' contraventions and if those employees became regular contraveners, they would then be thrown off site and it would be up to the subcontractor to see where that employee would now work from.

Prohibition notices were also reported to have a significant impact in decreasing the number of safety contraventions committed. The subcontractor would receive a prohibition notice after a number of repeated offences and all his work on site would stop until such time that

the contravention had been rectified. As much as this method worked well, it also lead to decreased productivity for the subcontractor, the principal contractor and the project overall. Other less effective methods used included verbal warnings and fines or contra-charges.

4.4.5 Managers were then asked to rate five statements in varying degrees. It began with the correlation between high H&S standards and high project morale and the successful delivery of the project. This statement was strongly agreed with by all three managers. It was then stated that all site stakeholders were equally responsible for safety on site. Again, all three managers agreed strongly with the statement. When asked about the positive effect of H&S training, again, all three managers agreed strongly that training was good site practice.

The deviation came along in the last two statements. When the statement was posed that preventative action negated the need for corrective action once an incident occurred, two of the managers agreed while one did not. The one who did not agree stated that a principal contractor could never show complacency with human ways and errors and always had to be ready for any incidents to occur, no matter the contractor's level of preparation. One of the managers who had agreed with the statement stated that the statement was good in theory however was not practical on site as there was not enough time to always think far ahead with safety.

The final statement stated that the enforcing H&S compliance enabled the successful delivery of the project. One contractor agreed with the statement while the other two remained neutral. The one who agreed with the statement stated that enforcing compliance did not do much to decrease productivity thus had a good impact overall. The other two managers stated their concerns regarding the time spent in enforcing compliance, however, they mentioned that they were only aware of the paperwork involved and not the practical side of enforcing compliance thus had chosen to remain neutral.

When asked whether safety management was an expensive task, one manager stated that allowances were provided for when submitting the safety plan during tender stage. As such, he felt safety management was not expensive. His statement was supported by another manager who stated that legislation required a set number of safety officers or representatives per construction site. This requirement was fairly low standing at one H&S-trained employee

per thirty employees thus this was not expensive. The third manager argued that although safety management itself was not expensive, when looking at income generated for the project the task became expensive as one could not claim for it thus the project received no financial return on this item.

4.4.6 The interview went back training. It was asked how much training the managers had received since arriving on the site. One manager had not received any training. He stated that running two big sites kept him very busy. He added that training courses had been offered to him but that he simply did not have the time to attend any of them. One manager had only been on safety manager training. It had been explained to him that the client was prudent about the manner in which safety was to be run on site thus he had been sent on a refresher course for safety management. The third manager had been on a number of courses although not all of them were safety-related. The safety-related course was Risk Management (HIRA) while the other two were Leadership and Supply-chain and Procurement. When asked which of the three he found most relevant, he stated that Leadership was as it exposed him to new methods of working with and managing the different characters in the construction industry.

Figure 4.4 Methods to ease the management of safety

The final question in the interview looked at ways in which the management of safety could be made easier. Training was once again mentioned along with implementing a zero-tolerance attitude. It was mentioned that once rules had been set in place, all workers had to abide by those rules and no single person could be treated as being above the law. It was agreed that this was usually the easiest method to safety management but that pressure and inconsistency often led to this method sliding away. One manager did emphasize that communication across all levels needed to be improved so that everyone could understand what was going on.

Reliability of data collected:

The Cronbach alpha (α) figure obtained from these interviews was 0.85 indicating a significantly high correlation and reliability level. The respondents were consistent in their answers and their answers did not vary much amongst them.

4.5 Summary and discussion of analysis

4.5.1 Expected versus Actual results of the labourforce

The following items were some of the expected results:

- It was expected that the labourforce had a more passive stance on the management and regulation of health and safety on site.
- It was expected that they expected management to provide the motivators for them in their working environments.
- It was expected that the labourforce had very little understanding of the safety legislation and their company safety policies.
- It was expected that the labourforce took no responsibility or accountability for safety and possible consequences arising from neglect thereof.
- It was expected that the labourforce had very poor communication skills on all fronts, whether verbal or written.
- It was expected that the labourforce had little interest in training unless for monetary gain or promotion.

What was actually recorded is listed below:

- The labourforce took active interest in the management and regulation of health and safety on site, especially individual health and safety. When workers were involved in the managing of health and safety, they were more aware of regulations and placed even more emphasis on creating safe environments around their tasks. Their inclusion in the management of health and safety also encouraged open dialogue amongst themselves and between them and their safety officers and supervisors.

- Not many of the workers interviewed had entered the construction industry by choice. Their negativity towards the industry was influenced by the number of accidents recorded, the dangers posed by the equipment used on site, the "dirty" appearance of the industry and the general low pay of the industry. Unfortunately, many of the workers either lacked formal education or were unable to find work in other industry and had to settle for the construction industry. Many employees had been surprised by the earning potential once they had entered the industry and worked harder to get promoted. Many of these workers were also family men. As such, they sought to take extra care of themselves and their colleagues, to ensure that they worked safely, in safe conditions.

- As expected, the majority of workers had little knowledge of their companies' safety policies. However, this was mainly due to the language factor. For many, their knowledge of English was poor. As much as they appreciated their companies displaying their policies, it was simply too much for them to read boards and boards of an unknown language. Even if they had dictionaries at their disposal, their inability to efficiently utilise the dictionaries, coupled with the lack of time they had to just sit and read, meant that the display of these policies served little purpose overall.

- A suggestion that came up often was for these policies to be transcribed into a number of languages. As they were fluent in their own languages, this would make the display of the policies more useful to them. Workers were aware that cultural

diversity was a problem amongst them. They had taken it upon themselves to try and integrate the different groups and they enjoyed getting to know each other's languages. They appreciated SHE reps that were multilingual. As such, these SHE reps often assumed multiple roles as they were used as "messengers" between the labourforce and management.

- The workers admitted that their written skills were poor, especially in English. Those who had been sent on ABET training grew in their confidence to express themselves in and to understand English. They agreed that English was a universal business language and felt it advantageous to know the language.

- Training was a rather contentious issue. Workers were happy that they were being sent for training, however, they wanted to be sent on technically superior training such as operator training or civil engineering. Workers felt that if they acquired skilled in this region, their earning potential would soar. Workers did not want any training to take place outside of working hours as they considered training and work as interchangeable elements, which both required pay.

4.5.2 Expected versus actual results of the safety officers

The following were some of the results expected from these safety practitioners:

- It was expected that this group was ultimately responsible for health and safety within the company.
- It was expected that the safety officers were the main implementers of change to health and safety matters on site.
- It was expected that this group was constantly sent on training to keep abreast of any changes to safety regulations and safety practices.
- It was expected that this group assumed the messenger role between the labourforce, the professional team and management.

The following indicate what was actually recorded:

- Legislation states the role safety officers are to assume on every project. The safety officers were very aware of this and made sure that not all the responsibility lay on

their shoulders. The one safety officer accepted that he would be held accountable for all safety on site. This was also the officer who was registered with a number of professional bodies so he had little doubt of his ability and he also played a far more active and influential role with regards to the management of health and safety on site.

- Safety officers realise the magnitude of aspects involved in the management of health and safety. These officers therefore made full use of SHE reps and trained as many competent SHE reps as possible to that they knew the site would not fall apart should they not be present for a particular period. The safety officers assumed a more managerial role as they delegated, within reason, many of their tasks to the SHE reps. One task they did not delegate was meeting with safety auditors during the weekly or safety auditors.

- A surprising finding was that this group was not sent on training courses as often as expected. The safety officers reasoned that there were only a limited number of useful courses to do and that their managers found them too integral to be away from site for long periods.

- The other surprising finding was that these officers did not assume the "messenger" role. They found that their SHE reps had far more influence with the labourforce and felt free to let them assume this role. If there were matters need urgently needed the attention of management, they assumed the "messenger role".

4.5.3 The expected versus the actual results from management

The expected results from the management interviews were as follows:

- Managers were expected to have very little involvement or interest in the running of health and safety.
- Training was planned by the Human Resources department with little input from the managers.
- Management disregarded cultural diversity on site and expected everyone to speak one language – English.

- Communication between management and the labourforce was delegated, by management, to the Human Resources department, even matters pertaining to site.
- Management perceived many aspects in the running of health and safety as expensive.

The actual findings were as follows:

- Managers involvement and interest of health and safety matters peaked during tendering stage. The key to winning the tender lay in the attention to detail and they had to ensure that all elements, including the safety plan, met the clients' specifications. Thereafter, safety management was mainly the responsibility of the safety officers, however, the management still assumed ultimate responsibility for safety on site.

- The bulk of organizational training was placed in the hands of the Human Resources department, however, this needed to be approved by management. Some planning was required on an as-needs basis, especially when new projects began or new employees were brought to the site thus this training would only have to go through the Human Resources department for payment authorisation.

- Management was very aware of the cultural diversity on site. This was a particular element they felt overwhelmed by and were not sure how to tackle. One manager did state that he felt far more comfortable when the labourforce communicated in English and also suggested that the use of English was to their own advantage too. The other managers relied on their safety officers, SHE reps and Human Resources departments in order to communicate with the workforce. When it was suggested that posters and policies be translated into other languages, the managers did not oppose this provided there was translated signage available at suppliers.

- The management of health and safety was not perceived as an expensive task as this was usually provided for in the tenders and required by law. However, the fact that no money could be generated from this was pointed out as a non-value adding item. Managers have resorted to contra-charging subcontractors who contravened safety

regulations and found this a reasonable and effective method of making some money from health and safety management.

Chapter 5 – Conclusion and Recommendations

This chapter sums up what was expected from the study, what the actual findings of the study were and what these achieved in relation to the research objectives and questions. The chapter also provides areas for future study based on the recommendations proposed.

5.1 Conclusion

The purpose of this paper was to understand what employees required from management in communicating factors encompassing safety compliance and safety management; to investigate what managers and safety officers could do to create a motivated and unified workforce in order to improve safety standards; discover cost-effective methods of implementing safety management; investigate the role of a good safety record on the company's overall performance and finally, to examine how legislative Acts could assist with the empowerment of employees and the overall improvement of safety on site.

Cultural diversity is a reality on South Africa, especially Johannesburg's, construction sites. Up to nine mother-tongue languages were reported to be spoken on the three sites visited. These included the languages of migrant workers. This tally did not include the managers, two of whom spoke Afrikaans as a home language and another whose home language was English. One barrier faced by most workers was the inability to read and write in English.

One site had sent its workers on an ABET course to improve their literacy and numerical skills. This is a relatively inexpensive method to improve the English skills of workers. There are grants funded by CETA which the companies can apply for in order to educate their workers. English cannot be the sole language used on site. In the past, supervisors made use of "funagalo" which was a mix of African languages, however, its use was mainly restricted to the mining industry and its use was flawed in that supervisors did not actually understand many of the languages. However, adopting funagalo was still better than solely using English on sites.

One must bear in mind the common understanding that adults struggle learning new languages. The feasibility of teaching managers and supervisors was not determined at this stage and perhaps it this could be evaluated in future research, or as a task for the Departments of Basic and Higher Education. At this stage, posters and signs can be

transcribed and printed into a few of the most widely spoken South African languages by institutions of learning and suppliers respectively.

Language, however, is not the only form of communication available to employees on site. Communication encompasses speech, visual and transcript components. Good communication is a key factor when implementing and managing safety programmes (Aksorn and Hadikusumo, 2008: 725) thus having a positive influence on project performance. The choice of communication-style must be considered by management and safety officers. Verbal communication can be used for quick transmission, however, feedback must be obtained. Managers must ensure that the message they were trying to relay was indeed understood. Should they require SHE reps or the Human Resources department to act as intermediaries in the communication, this is fine, provided they obtain feedback. Written communication is better for official communication but in order to avoid disputes, employees must sign that they understood the communication and that it was given to them. When used in all its forms, communication contributes tremendously to reducing accident rates.

Safety representatives are required by law. Construction regulation 23 of OHSA stipulates that every site requires one safety representative per twenty-one people (for the principal contractor) and one safety representative per fifty-one people for the office. A basic 'SHE rep' training course takes one full day and costs roughly R850 per person. This is not a major expense to any company, whether big or small. Just the incorporation and training of safety representatives can do a great deal to the improvement of health and safety management on sites, and furthermore, contribute to the successful delivery of the project. The results indicated that employees are keen to participate in site safety-management duties. They showed an awareness of the importance of safety management and those who had been included in the safety management process, appreciated the level of trust bestowed upon them by managers and safety officers. Managers were thoroughly aware of their safety obligations but, due to their own lack of time to make the necessary commitments, also trusted the safety officers as capable employees to manage the entire safety management process throughout each phase of construction.

The EEA incorporates the Skills Development Act of 1998 in encouraging the training of Blacks. Companies seem to undermine the demand for training by their employees. The EEA requires the submission of the Workplace Skills Plan to be submitted on an annual basis.

Even for organizations that do not value the planning of training, with the submission of this report, they will not have to plan for training separately therefore completing two tasks in one exercise.

5.2 Recommendations

1. From tendering stage, management should be concerned with the recruitment of multi-lingual and skilled site managers, supervisors, safety representatives and SHE reps. Should an identified employee lack any skills, these should be taught before commencing work on site.
2. Safety records were not established unreasonably. Organisations, both small and large, must commit to abiding to site regulations. Organisations not complying to them should receive harsher penalties and eventually blacklisted for a period of time. This should be done by a governmental agency other than the Department of Labour.
3. By establishing the right core team during tendering stage, roles will be determined for the duration of the project. One team member should be a communications specialist who details all communication requirements, written, verbal (meetings) and multimedia, from the start to the end of the project. This person must have the support of management.
4. Team building activities should be implemented to further integrate the different groups and levels found on site. Afternoon braai's, sporting leagues and informal meeting sessions can be used as inexpensive yet effective team-building sessions.
5. Training requirements should be established during tendering stage as well. This is if the training did not fall within the annual Workplace Skills Plan. Training should take place from labourforce through to managerial level. Where possible, the trained employee must be given the opportunity to utilise the skills learnt at the course even if this is only done via a presentation. The effect of the current downturn in the construction industry cannot be ignored. This is the reason given most when asking about poor training records. A similar study will have to review this once the construction industry has recovered.
6. There must be little distinction between site employees, the professional teams and visitors to the site. Everyone must be treated equally and adhere to site safety conditions. These conditions must be laid clearly in a compulsory site induction for

every person entering the site. Penalties for contraventions must be equally applicable for any person entering the site. This practice will encourage teamwork on site which should increase productivity and ultimately ensure the successful delivery of the project in terms of the project management principles of time, cost and quality

7. This research was limited to Johannesburg and the greater Johannesburg region. This region is a mix of a number of cultures. Research should be undertaken in other regions in South Africa where specific cultural groups dominate to establish whether communication and diversity management pose the same challenges as in the Johannesburg region.
8. With H&S regulation in building construction seen as lax as compared to engineering and mining industries, the prioritisation of diversity and communication, in relation to safety management should be explored.

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APPENDICES

APPENDIX A

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Faculty of Engineering and the Built Environment

School of Construction Economics and Management

22 November 2011

Dear Respondent,

I am inviting you to participate in a research project to study Communication and Health and Safety (H&S) in the Construction Industry. This research is conducted for the partial fulfillment for the study of Master of Science in Building. The title of my research is ***"Selecting and using the correct communication method during construction-safety processes to ensure optimal performance".*** Along with this letter is a short questionnaire that asks a variety of questions about Health and Safety. I am asking you to look over the questionnaire and, if you choose to do so, complete it and send or give it back to me. The majority of these questions will be posed to you via interview format thereby negating the need for you to complete the questionnaire yourself. The process should take about 35 minutes to complete.

I am not aware of any risks to you if you decide to participate in this survey and I guarantee that your responses will not be identified with you personally. Furthermore, no results will reflect your company's name or site; your participation will be anonymous. I would like to reassure that the information obtained in the administration of this questionnaire shall strictly be for academic purposes and all data shall remain strictly confidential. You are also encouraged not to put your name on the questionnaire.

I hope you will allow me the time to interview you or have you take the time to complete this questionnaire and return it. Your participation is voluntary. Regardless of whether you choose to participate, please let me know if you would like a summary of my findings. My contact details are at the end of the questionnaire.

If you have any questions or concerns about completing the questionnaire or about being in this study, you may contact me at +27722455916. The University of the Witwatersrand has approved this study. However if you have any concerns about your rights as a participant in this study you may contact my supervisor, Dr H Quainoo on Mobile: +27 72 453 3149: E-mail: harry.quainoo@wits.ac.za

Your participation in this research is greatly appreciated.

Yours faithfully,

Teboho Selatile

University of the Witwatersrand

Mobile: 072 245 5916

Email: selatilet@hotmail.com

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Faculty of Engineering and the Built Environment

School of Construction Economics & Management

LABOURER QUESTIONNAIRE

Research Topic:

Selecting and using the correct communication method during construction-safety processes to ensure optimal performance.

The purpose of this research is to assess the level of communication in Health and Safety per construction phase and determine what type of communication is required for Health and Safety per construction phase in the South African Construction Industry.

You are therefore requested to answer the following questions by placing a cross in the box next to the appropriate answer of your choice. Where a free response answer is required, please write it down in the spaces provided. You are free to supply any additional information that you feel may be helpful to this research.

Your participation in this research is greatly appreciated.

QUESTIONS:

1. How long have you been stationed at this site?

☐	Less than 3 months	☐	3 – 6 months
☐	6 – 18 months	☐	More than 18 months

2. How long have you been with the company?

☐ Less than 6 months ☐ 6 months – 1 year

☐ 1 – 5 years ☐ More than 5 years

3. How long have you been working in the construction industry?

☐ Less than 1 year ☐ 1 – 5 years

☐ 5 – 10 years ☐ More than 10 years

4. What is your role on site?

_____

5. Is this your official role? If not, why have you taken on this role?

_____

_____

_____

6. Did you receive official induction training when you arrived on this site?

☐ Training received ☐ No training received

7. In what language was the induction conducted in?

☐ English

☐ Afrikaans

☐ Other (Please specify) _____

8. What is your home language?

☐ Afrikaans ☐ English

☐ isiNdebele ☐ IsiSwati

☐ isiXhosa ☐ isiZulu

☐ Sepedi ☐ Sesotho

☐ Setswana ☐ Tshivenda

☐ Xitsonga ☐ Portuguese

☐ Shona ☐ Other (please specify) _____

9. How was your understanding of the induction training tested? (You may cross more than 1)

☐ Written test

☐ Interview (informal or formal)

☐ Stickers handed out

☐ Other (please specify)

10. What training have you received since arriving at this site? (you may cross more than 1)

☐ SHE (safety) Representative ☐ First Aid

☐ Fire Fighting ☐ HIRA (Risk Assessment)

☐ Incident Investigation ☐ Excavation

☐ Operator ☐ Trade-specific

☐ Scaffolding ☐ Electric and Power tools

☐ Other (please specify) _____

11. How is safety reinforced on site?

_____

_____

_____

12. How often is this done?

☐ Daily ☐ Weekly

☐ Fortnightly ☐ Monthly

13. Are you fully aware and knowledgeable of the company's safety policy for this site?

☐ Complete ☐ Unknown

☐ Somewhat knowledgeable (please specify)

_____

14. What is your role when it comes to safety on this site?

_____

_____

_____

_____

15. How seriously do you think safety is taken on this site?

_____

16. What challenges do you face with regards to health and safety on site?

_____

_____

_____

_____

_____

17. When do you, or are you likely to face such challenges?

- ☐ When the site begins
- ☐ As more subcontractors arrive on site
- ☐ Towards finishing stage of a site
- ☐ Anytime

18. Who do you communicate with when you face such challenges?

_____

_____

_____

19. What changes would you propose in the way in which health and safety are dealt with on site?

_____

_____

_____

_____

Thank you for your participation!

APPENDIX B

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Faculty of Engineering and the Built Environment

School of Construction Economics and Management

QUESTIONNAIRE: SAFETY OFFICERS/CONSULTANTS

Research Topic:

Selecting and using the correct communication method during construction-safety processes to ensure optimal performance.

The purpose of this research is to assess the level of communication in Health and Safety per construction phase and determine what type of communication is required for Health and Safety per construction phase in the South African Construction Industry.

You are therefore requested to answer the following questions by placing a cross in the box next to the appropriate answer of your choice. Where a free response answer is required, please write it down in the spaces provided. You are free to supply any additional information that you feel may be helpful to this research.

Your participation in this research is greatly appreciated.

QUESTIONS

1. What qualification/training do you have?

   ☐ University Degree

   ☐ Diploma (higher, national, postgraduate)

2. How many safety officers are on this site?

   _____

3. How long have you been on this site?

   ☐ From the beginning

   ☐ Other (please state) _____

4. Is it assumed that every person has been exposed to site conditions by the time they arrive here?

   ☐ Assumptions are made ☐ No assumptions are made

5. What safety planning was done at the commencement of this site (project)?

   _____

   _____

   _____

   _____

   _____

6. How has this planning been updated as the site (project) progressed, ie: is your approach the same from start to handover? What are the benefits or disadvantages thereof?

   _____

   _____

   _____

   _____

7. Who are all the stakeholders who actively manage health and safety on this site?

   ☐ Safety officer/s

   ☐ Safety Representative/s

   ☐ Foreman (general; section; junior)

   ☐ Contracts Manager

   ☐ Professional Team

   ☐ Other (please specify) _____

8. How is health and safety managed on this site – daily, weekly, monthly?

_____

_____

_____

_____

9. How many reportable incidents have occurred on this site?

- ☐ 1 - 5
- ☐ 5 - 10
- ☐ More than 10

10. How can these incidents be categorized?

- ☐ Near Miss
- ☐ Injury
- ☐ Disability
- ☐ Death

11. What was the cause of these incidents and how could they have been prevented?

_____

_____

_____

_____

_____

12. When are these incidents more likely to occur?

- ☐ At the start of the project
- ☐ When subcontractors start arriving in numbers
- ☐ At the finishing stage of the project
- ☐ Towards project-handover
- ☐ Anytime (please justify)

_____

13. What corrective action is taken once the incidents occur and when is the action taken?

_____

_____

_____

14. How is non-compliance by principal and sub- contractors handled on site?

_____

_____

_____

15. How do you think non-compliance should be handled?

_____

_____

_____

_____

16. How is cultural diversity, with regards to health and safety, managed on site?

_____

_____

_____

_____

17. In your opinion, is language the only barrier to understanding health and safety on site? How can these barriers be addressed? (Please motivate your answer)

_____

_____

_____

_____

18. How often to management and labourers meet to discuss health and safety matters?

☐ Daily ☐ Weekly

☐ Monthly ☐ Never

19. Who is chiefly responsible for training on site?

_____

20. What training have you received since working at this site?

_____

_____

_____

Thank you for your participation.

APPENDIX C

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Faculty of Engineering and the Built Environment

School of Construction Economics & Management

MANAGEMENT QUESTIONNAIRE

Research Topic:

Selecting and using the correct communication method during construction-safety processes to ensure optimal performance.

The purpose of this research is to assess the level of communication in Health and Safety per construction phase and determine what type of communication is required for Health and Safety per construction phase in the South African Construction Industry.

You are therefore requested to answer the following questions by placing a cross in the box next to the appropriate answer of your choice. Where a free response answer is required, please write it down in the spaces provided. You are free to supply any additional information that you feel may be helpful to this research.

Your participation in this research is greatly appreciated.

QUESTIONS:

Please make a cross next to the appropriate box:

1. Are you:

☐ Male ☐ Female

2. Please indicate your race (for statistical purposes only)

☐ Black

☐ White

☐ Indian

☐ Coloured

☐ Asian

☐ Other (please specify) _____

3. What is you highest level of education?

☐ High School

☐ College / Technikon

☐ University

☐ Other (please specify) _____

4. How long have you been working in the construction industry?

☐ 0 – 5 years ☐ 6 – 10 years

☐ 11 – 15 years ☐ 16 – 20 years

☐ 21 – 25 years ☐ More than 25 years

5. How long have you been working with your current company?

☐ 0 – 5 years ☐ 6 – 10 years

☐ 11 – 15 years ☐ 16 – 20 years

☐ 21 – 25 years ☐ More than 25 years

6. What is your position on site/on this project?

_____

7. How long have you been working on this site/project?

☐ 0 – 6 months ☐ 6 - 12 months

☐ 12 – 18 months ☐ 18 – 24 months

☐ More than 24 months

8. Were you involved in formulating the safety plan (during tender stage) for this site/project?

☐ Complete involvement

☐ No involvement

☐ Somewhat (Please explain in Question 10)

9. Were you involved in implementing the safety plan on site?

☐ Complete involvement

☐ No involvement

☐ Somewhat (Please explain in Question 10)

10. Please elaborate the extent of your involvement.

_____

_____

_____

_____

_____

_____

11. How often is the safety plan reviewed?

☐ Monthly

☐ Bi – monthly

☐ Quarterly

☐ Twice a year

☐ Never

☐ Other (Please specify)

_____

_____

_____

12. What are the advantages or disadvantages of reviewing the safety plan?

_____

_____

_____

_____

_____

_____

13. How do you communicate with site on staff? (you may tick more than 1)

☐ Written communication

☐ Verbal communication

☐ Both

☐ Other (eg: pictorial, visual aids, multimedia, etc.)

14. Is the language usage mainly in English?

☐ English is the primary language

☐ English is not the primary language

☐ Other languages are used (please specify)

_____

15. How do you ensure that every person on site understands safety and safety standards?

_____

_____

_____

16. How is non-compliance by your own staff as well as subcontractors handled?

_____

_____

_____

_____

17. Please rate the following as per these indicators:

    1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree

	1	2	3	4	5
High health and safety standards have a positive effect on project morale and the successful delivery of the project					
All site stakeholders are equally responsible for safety on site					
Health and safety training is good site practice and ensures good site safety records					
Taking preventative action negates the need for taking corrective action once incidents occur					
Enforcing compliance enables the successful delivery of the project					

18. Is the management of safety an expensive task and how extensively is this provided for during the submission of tenders?

☐ Safety is expensive ☐ Safety is not expensive

_____

_____

_____

19. How much training have you received since arriving on site?

_____

_____

_____

_____

20. How can the management of safety be made easier, from a practical point of view?

_____

_____

_____

_____

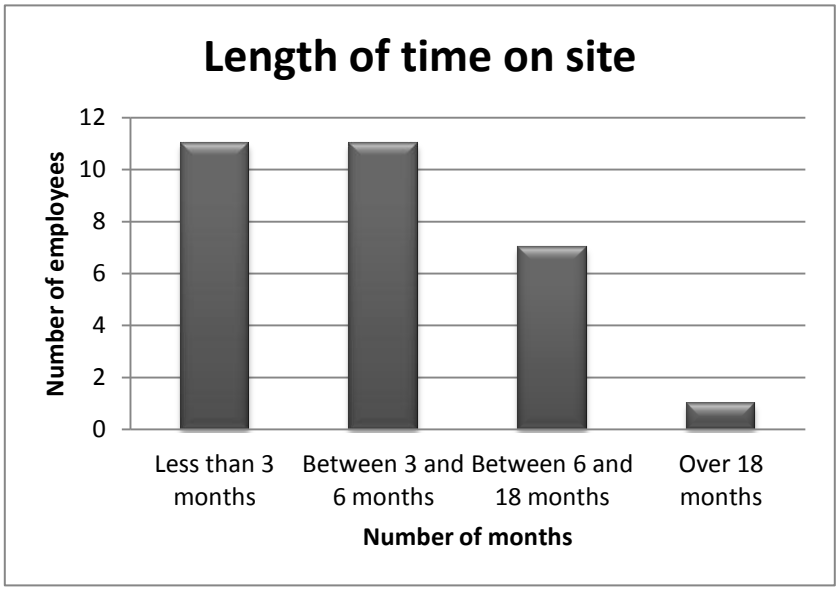
Thank you for your participation.

APPENDIX D

Data Analysis - Labour-force

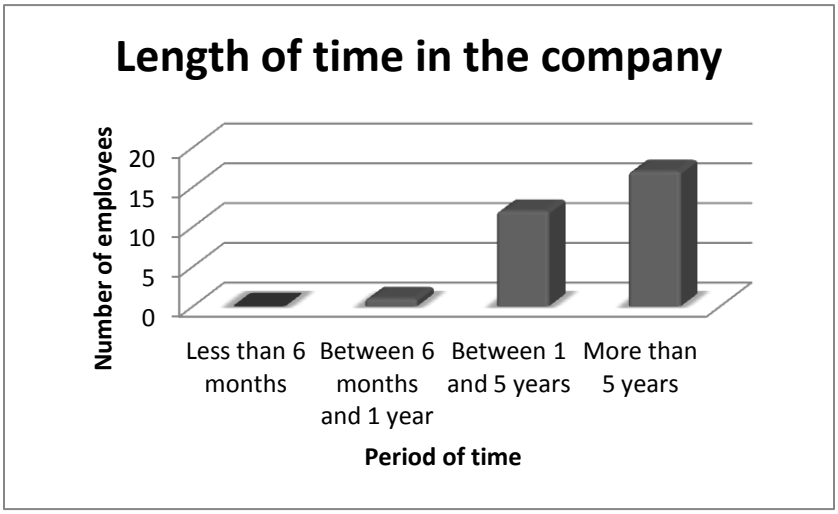
1. How long have you been working at this site?

Less than 3 months	11
Between 3 and 6 months	11
Between 6 and 18 months	7
Over 18 months	1



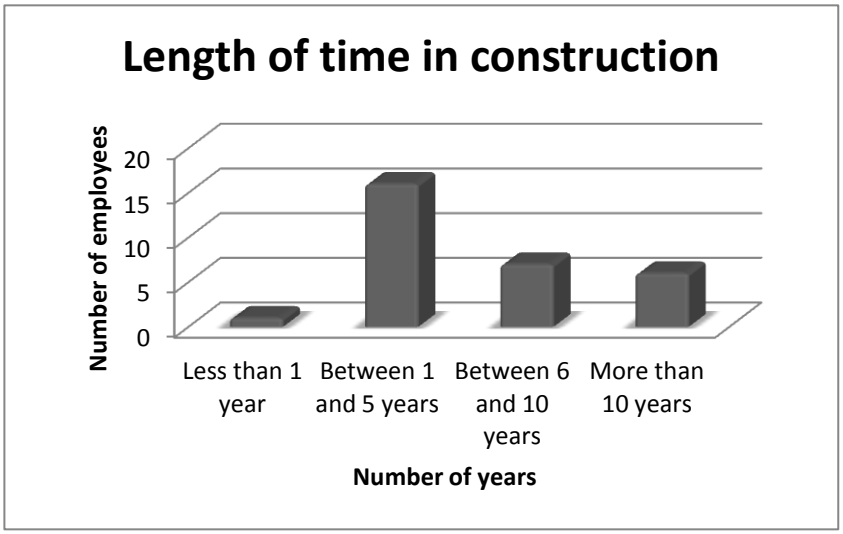
2. How long have you been working for your company?

Less than 6 months	0
Between 6 months and 1 year	1
Between 1 and 5 years	12
More than 5 years	17



3. How long have you been working in the construction industry?

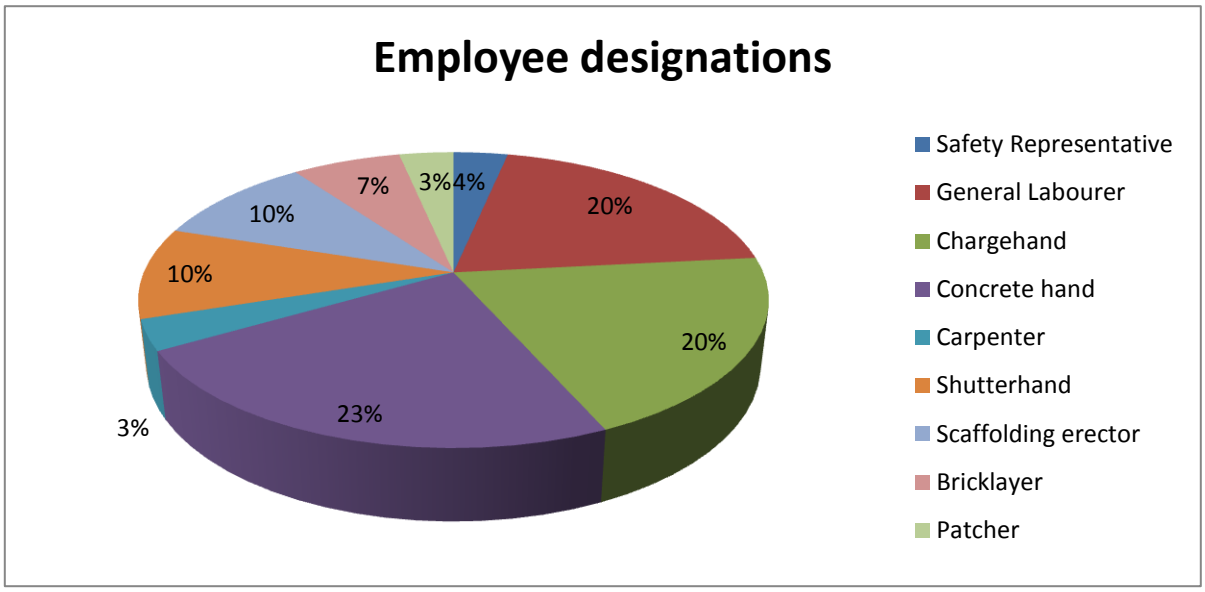
Less than 1 year	1
Between 1 and 5 years	16
Between 6 and 10 years	7
More than 10 years	6



4. What is your designation on site?

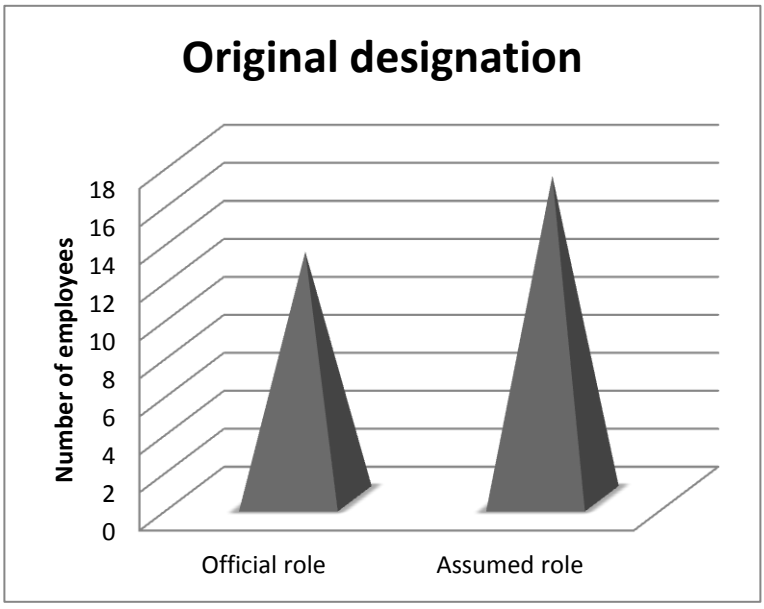
Safety Representative	1
General Labourer	6
Chargehand	6
Concrete hand	7
Carpenter	1
Shutterhand	3
Scaffolding erector	3

Bricklayer	2
Patcher	1



5.a) Is this your official role?

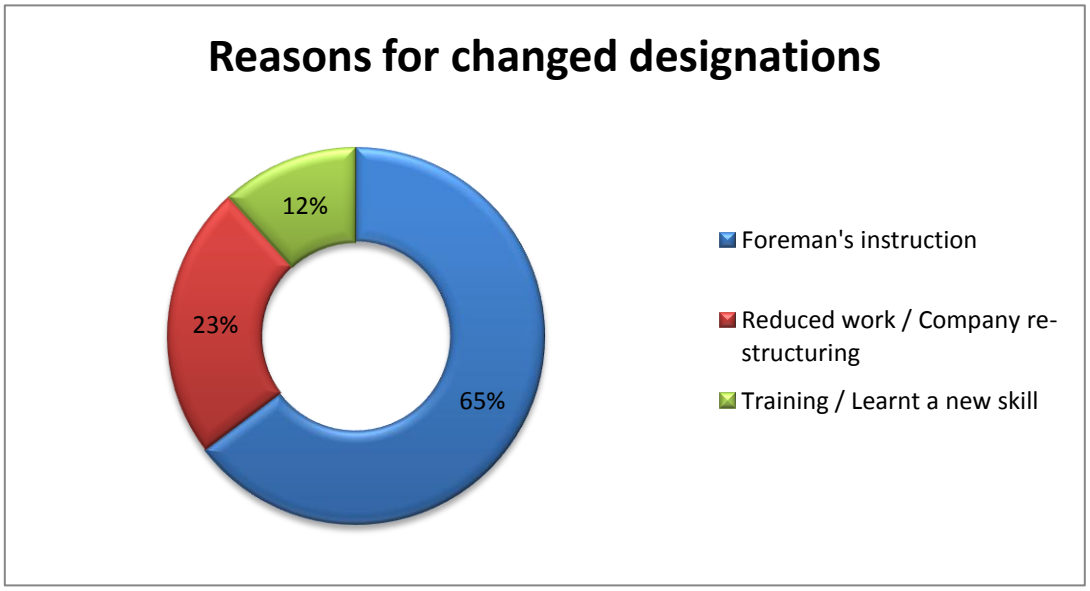
Official role	13
Assumed role	17



5.b) If not, why have you taken on this role?

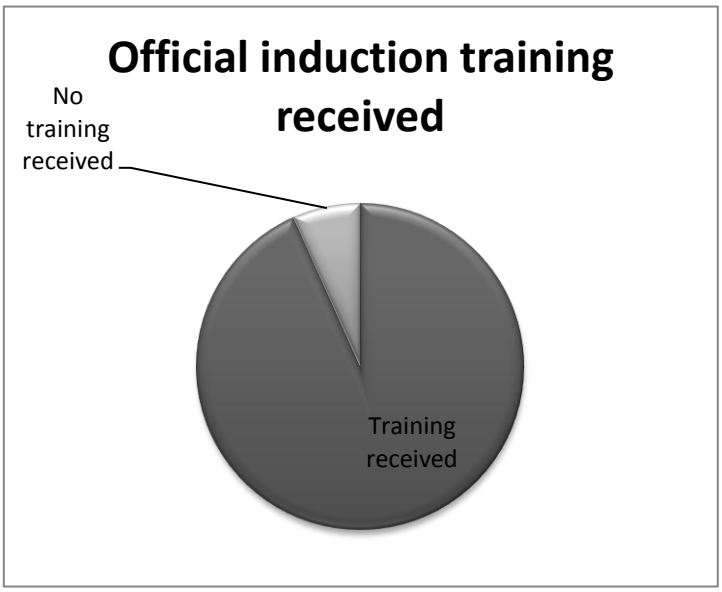
Foreman's instruction	11

Reduced work / Company re-structuring	4
Training / Learnt a new skill	2



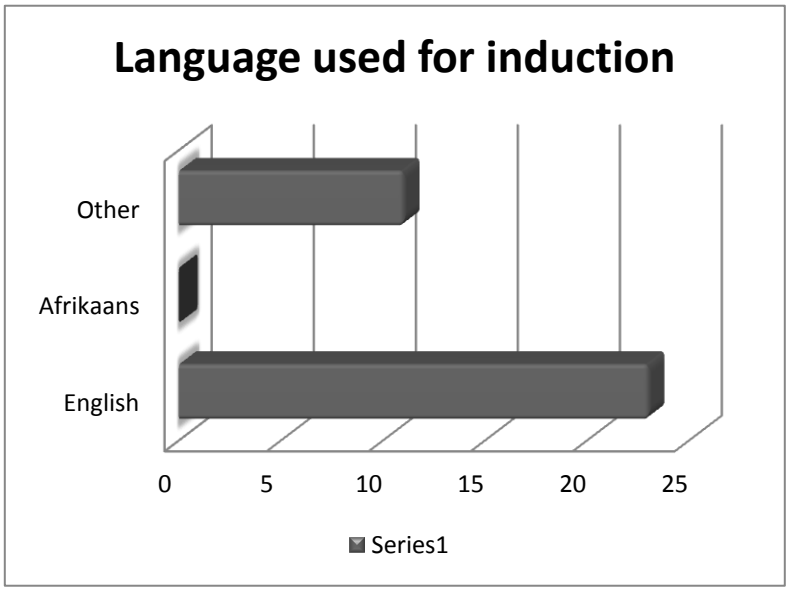
6. Did you receive official induction training when you arrived at this site?

Training received	28
No training received	2



7. In what language was the induction conducted?

English	23
Afrikaans	0
Other	11

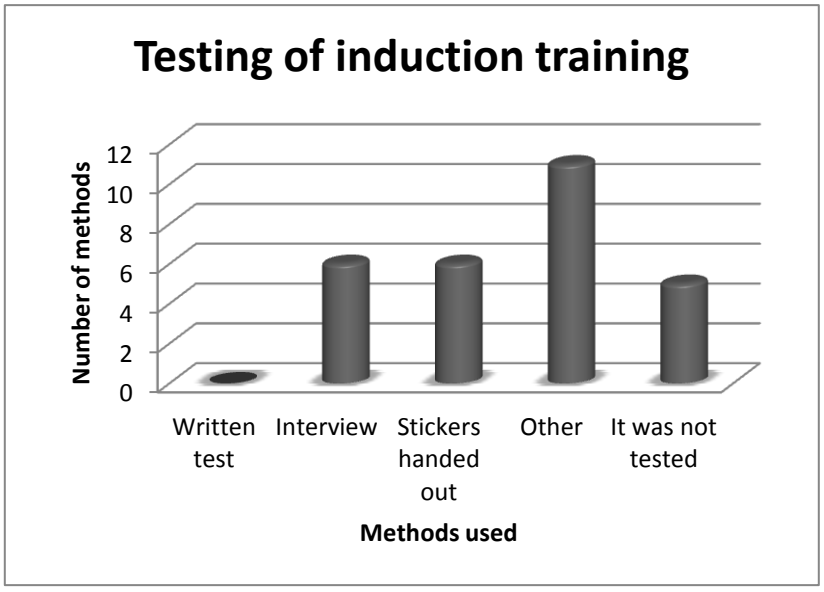


8. What is your home language?

Afrikaans	0
English	0
Ndebele	0
IsiSwati	0
IsiXhosa	5
IsiZulu	1
Sepedi	4
Sesotho	4
Setswana	5
Tshivenda	1
Xitsonga	5
Portugese	1
Shona	4
Other	0

9. How was your understanding of the induction training tested?

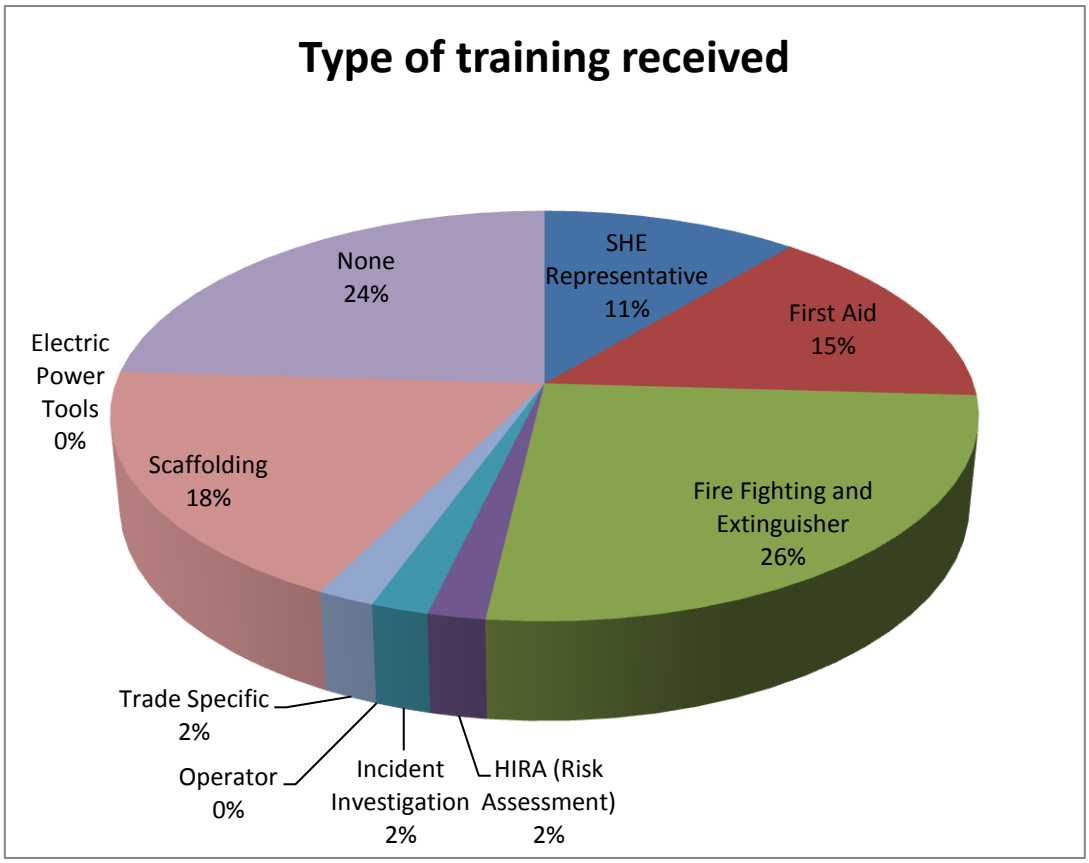
Written test	0
Interview	6
Stickers handed out	6
Other	11
It was not tested	5



10. What training have you received since arriving at this site?

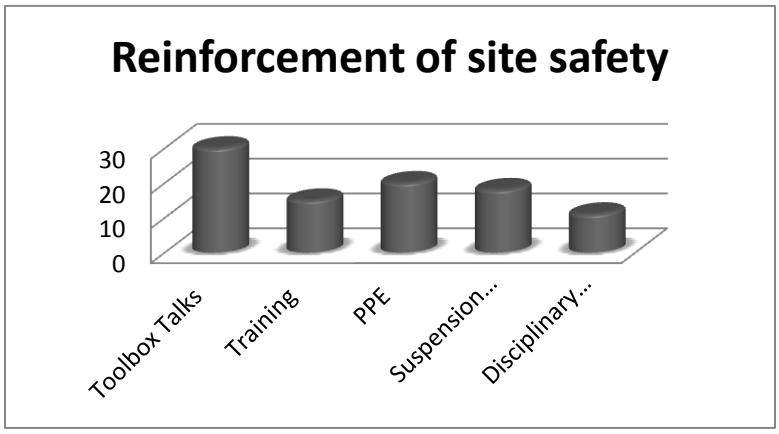
SHE Representative	6
First Aid	8
Fire Fighting and Extinguisher	14
HIRA (Risk Assessment)	1

Incident Investigation	1
Operator	0
Trade Specific	1
Scaffolding	10
Electric Power Tools	0
None	13



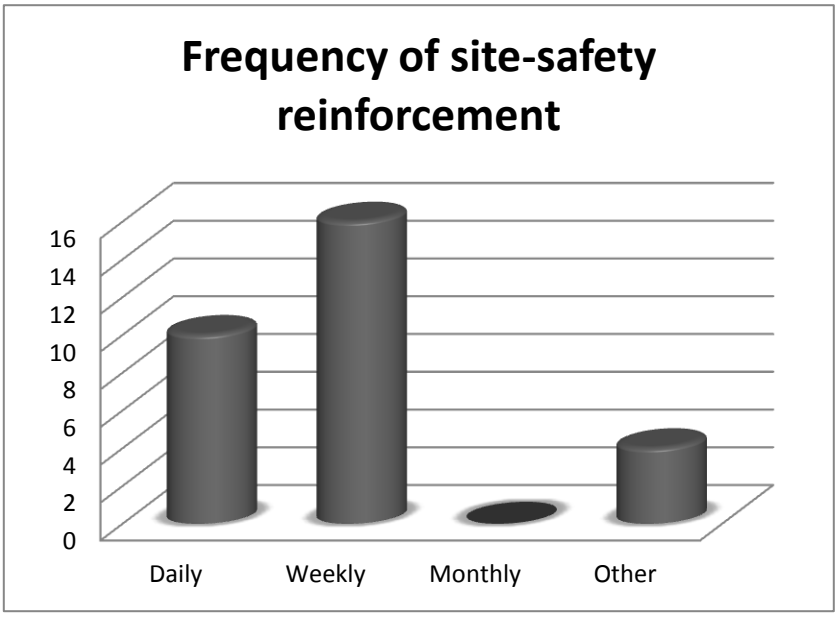
11. How is safety reinforced on site?

Toolbox Talks	30
Training	15
PPE	20
Suspension for contravention	18
Disciplinary hearings	11



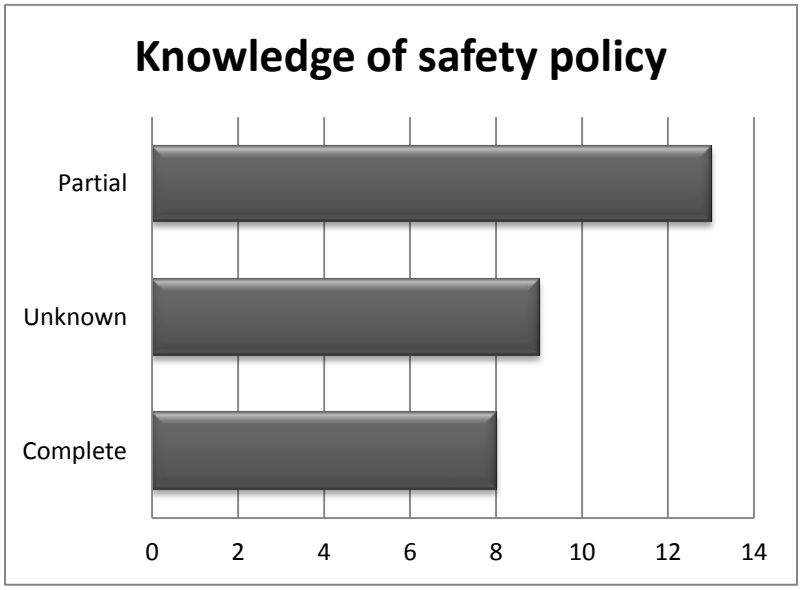
12. How often is this done?

Daily	10
Weekly	16
Monthly	0
Other	4



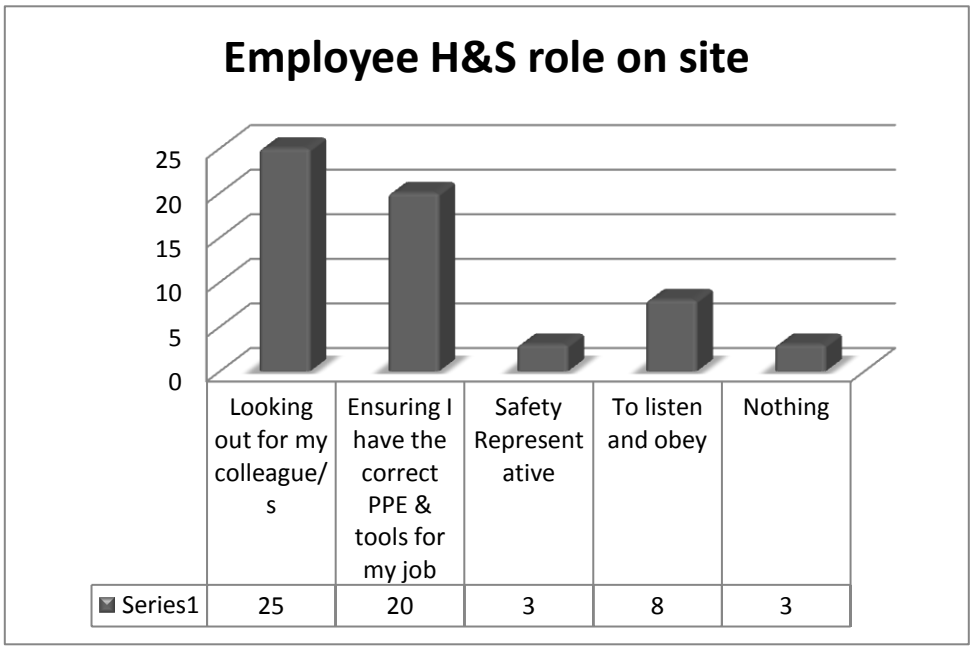
13. Are you fully aware and knowledgeable of your company's safety policy?

Complete	8
Unknown	9
Partial	13



14. What is your role when it comes to safety on this site?

Looking out for my colleague/s	25
Ensuring I have the correct PPE & tools for my job	20
Safety Representative	3
To listen and obey	8
Nothing	3

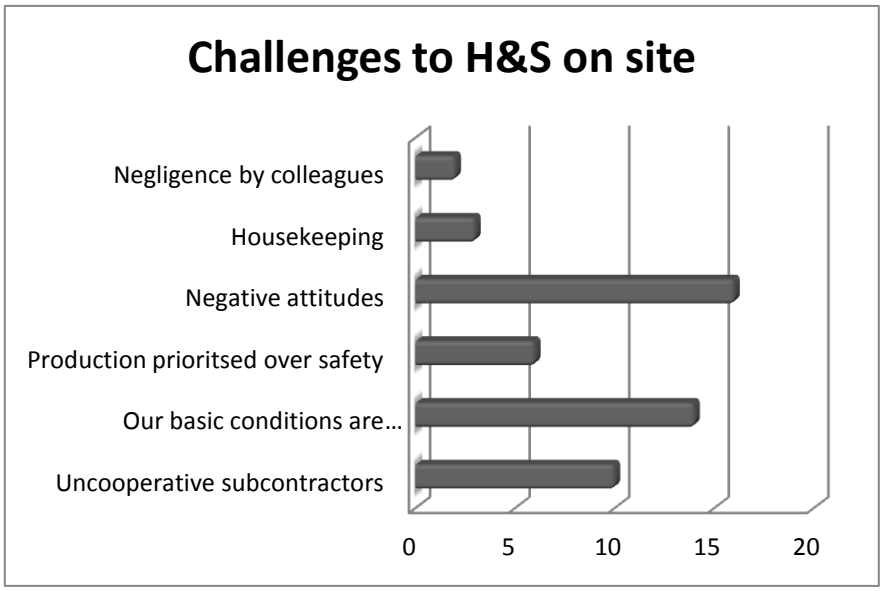


15. How seriously do you think safety is taken on site?

Not seriously	2
Seriously	6
Very seriously	22

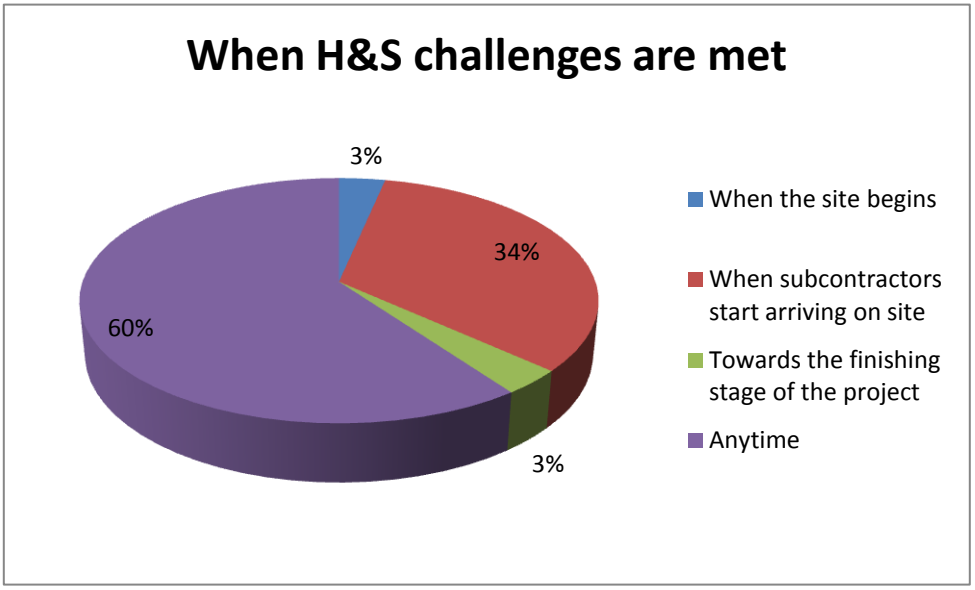
16. What challenges do you face with regards to health and safety on site?

Uncooperative subcontractors	10
Our basic conditions are undermined	14
Production prioritsed over safety	6
Negative attitudes	16
Housekeeping	3
Negligence by colleagues	2



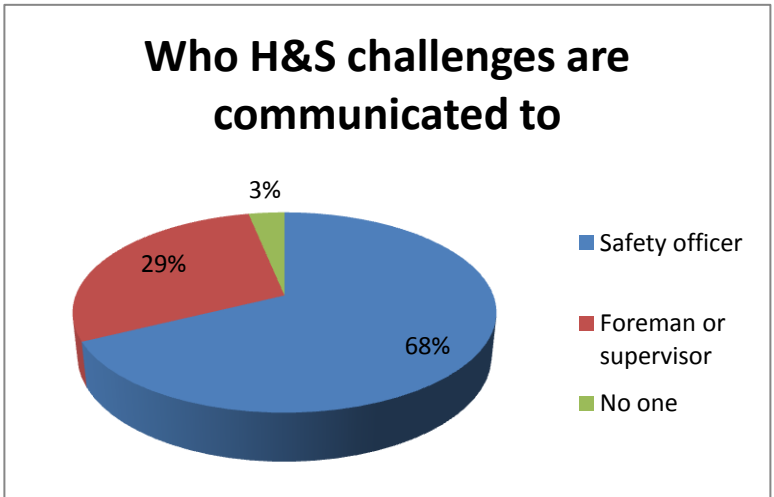
17. When do you, or are you most likely to face such challenges?

When the site begins	1
When subcontractors start arriving on site	10
Towards the finishing stage of the project	1
Anytime	18



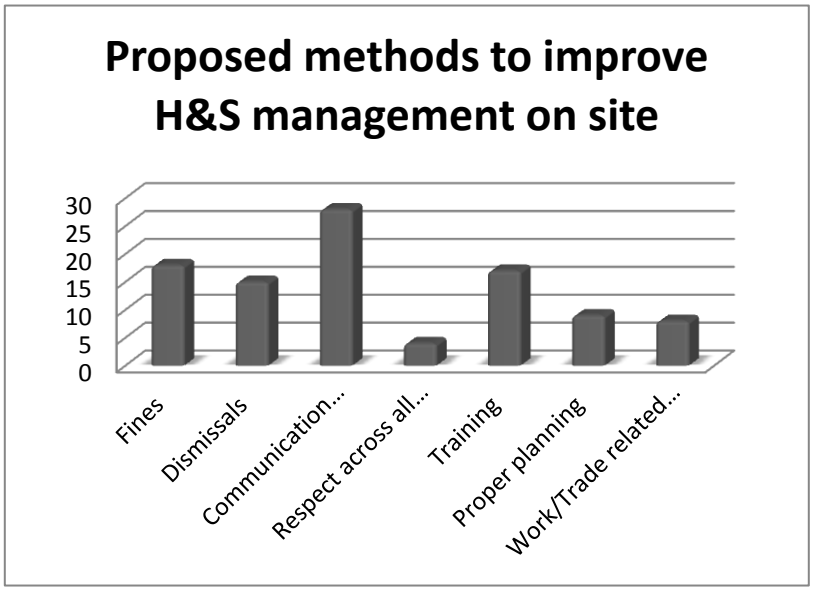
18. With whom do you communicate when you face such challenges?

Safety officer	21
Foreman or supervisor	9
No one	1



19. What changes do you propose in the manner in which health and safety is dealt with on site?

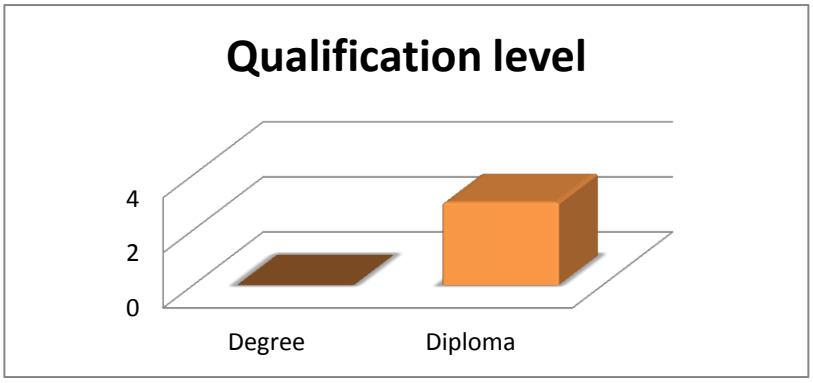
Fines	18
Dismissals	15
Communication across all levels	28
Respect across all levels	4
Training	17
Proper planning	9
Work/Trade related tasks	8



Data Analysis - Safety officers

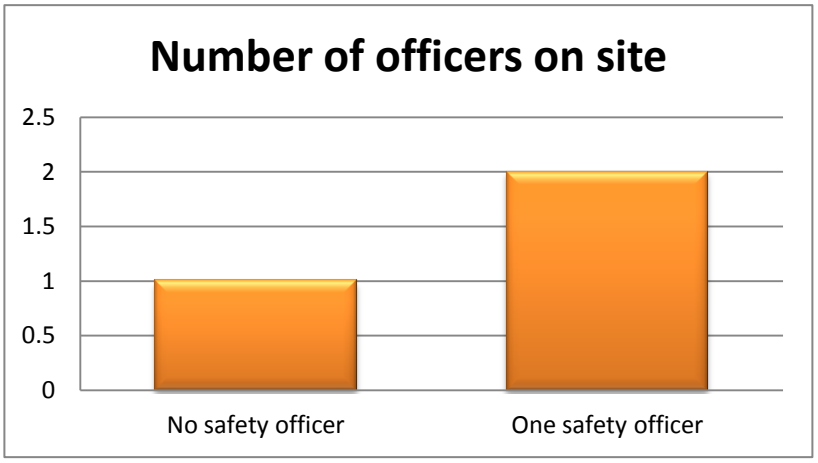
1. What qualification do you have?

Degree	0
Diploma	3



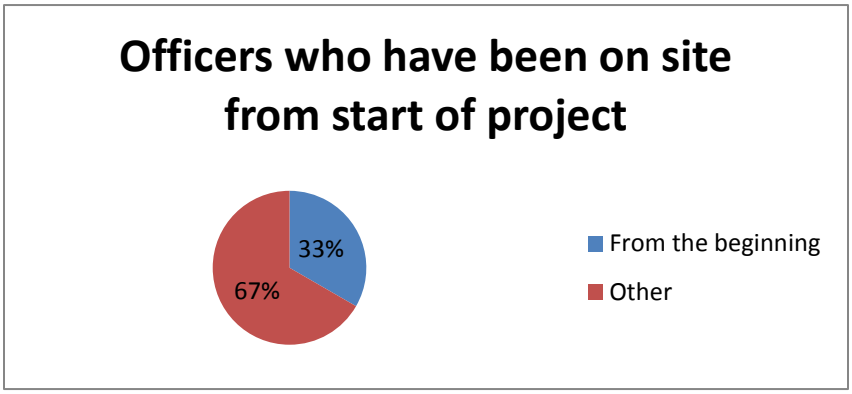
2. How many officers are on this site

No safety officer	1
One safety officer	2



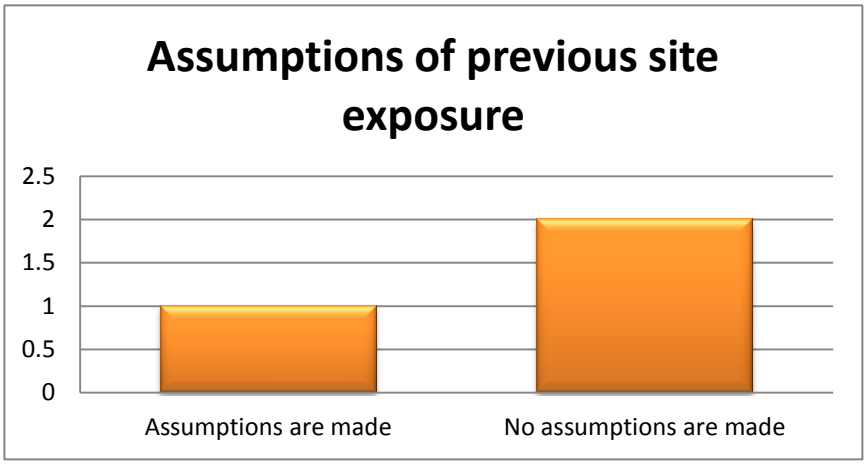
3. How long have you been on this site?

From the beginning	1
Other	2



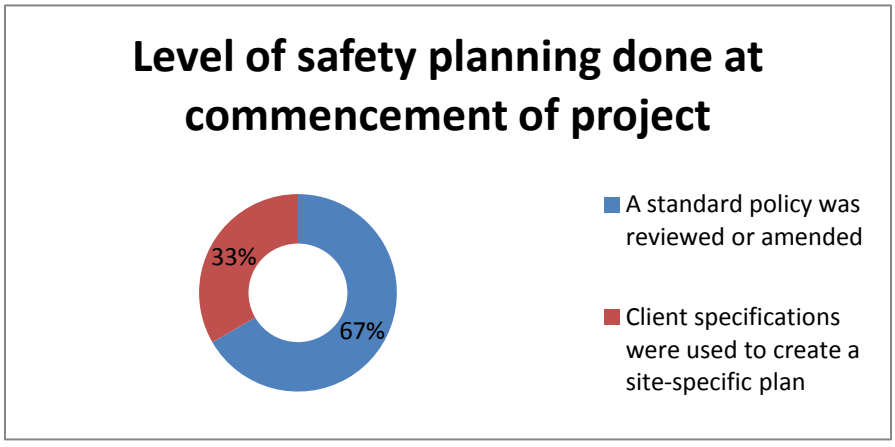
4. Is it assumed that every person has been exposed to site conditions upon their arrival on site?

Assumptions are made	1
No assumptions are made	2



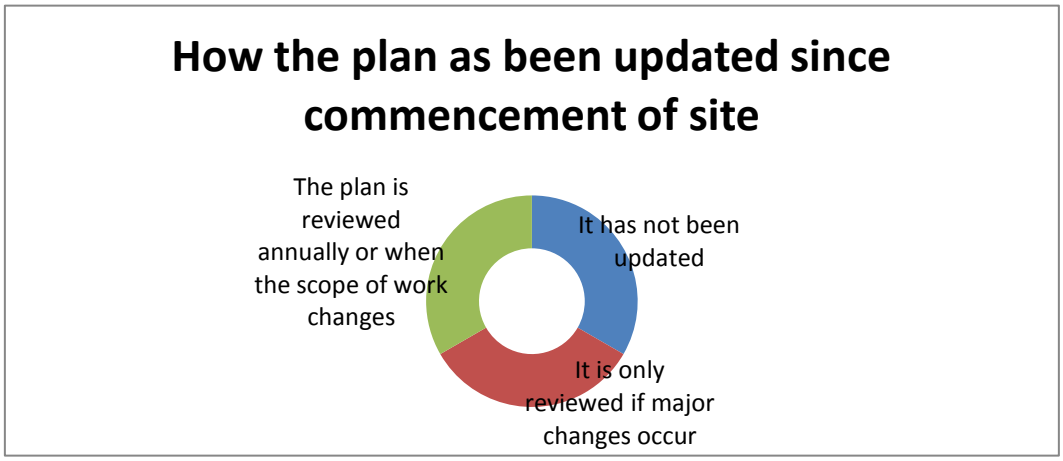
5. What safety planning was done at the commencement of this site?

A standard policy was reviewed or amended	2
Client specifications were used to create a site-specific plan	1



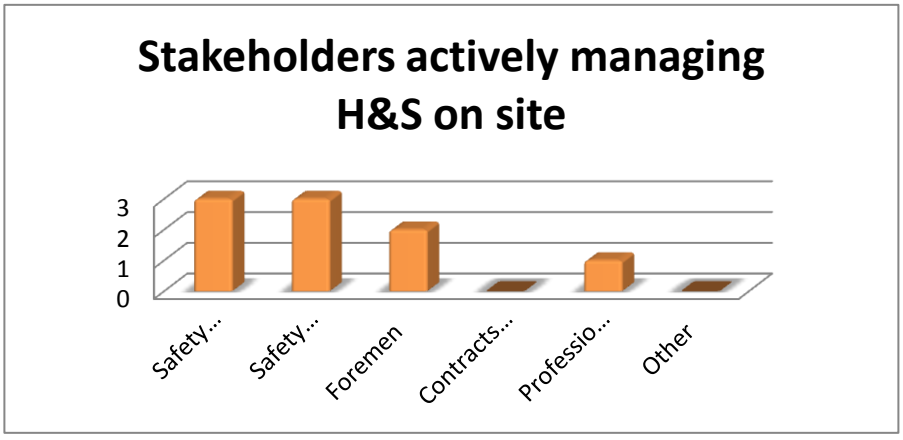
6. How has this plan been updated as the site has progressed?

It has not been updated	1
It is only reviewed if major changes occur	1
The plan is reviewed annually or when the scope of work changes	1



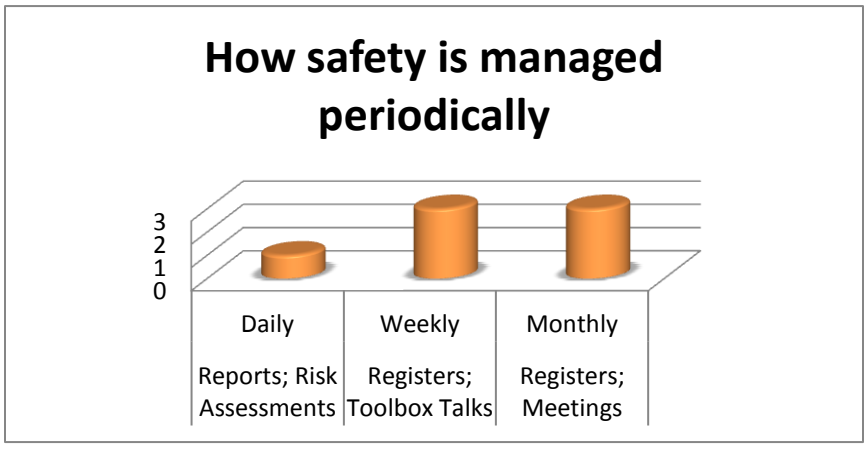
7. Who are all the stakeholders who actively manage health and safety on this site?

Safety officers	3
Safety representatives	3
Foremen	2
Contracts managers	0
Professional team	1
Other	0



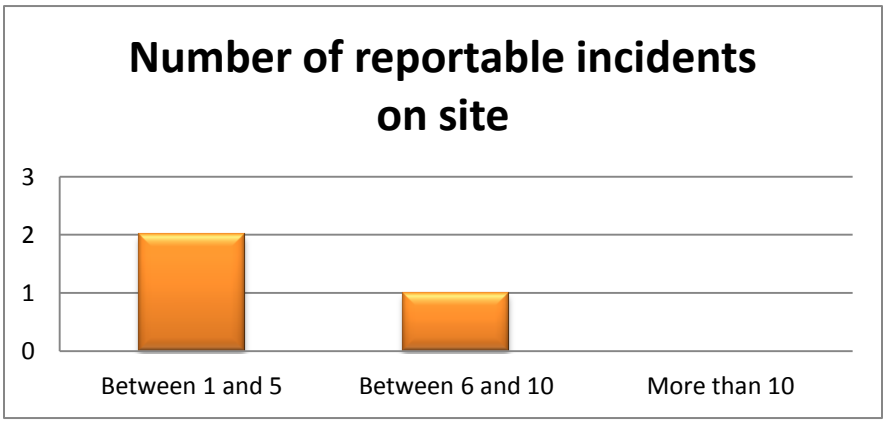
8. How is health and safety managed on this site - daily, weekly, monthly?

Reports; Risk Assessments	Daily	1
Registers; Toolbox Talks	Weekly	3
Registers; Meetings	Monthly	3



9. How many reportable incidents have occurred on this site?

Between 1 and 5	2
Between 6 and 10	1
More than 10	0

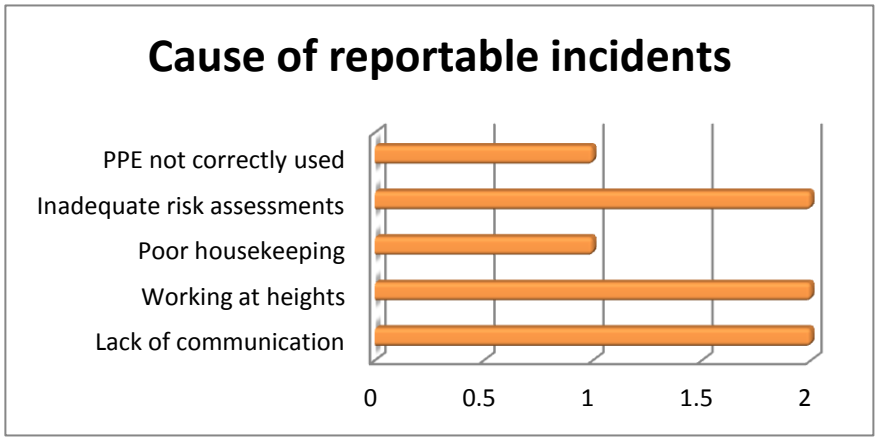


10. How can these incidents be categorised?

Near Miss	1
Injury	6
Disability	1
Death	0

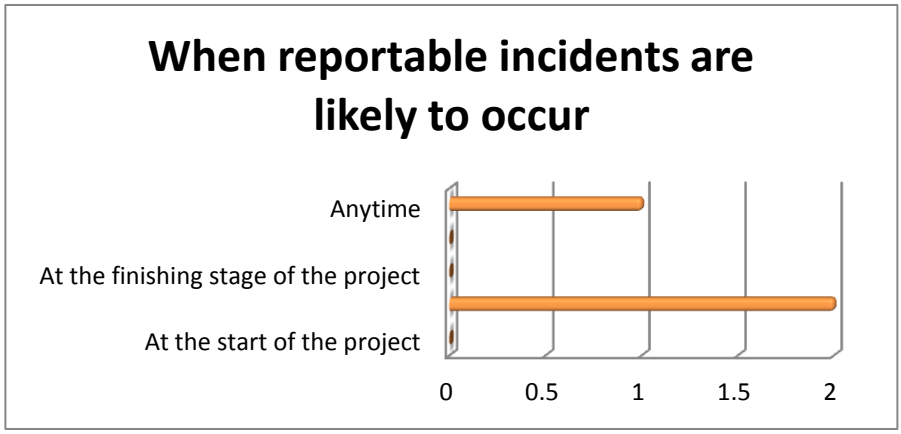
11. What was the cause of the incidents?

Lack of communication	2
Working at heights	2
Poor housekeeping	1
Inadequate risk assessments	2
PPE not correctly used	1



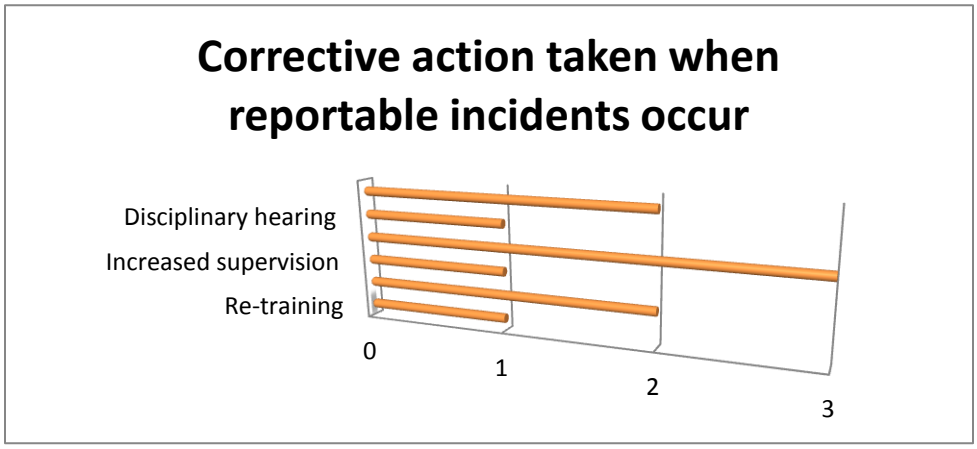
12. When are these incidents more likely to occur?

At the start of the project	0
When subcontractors start arriving in numbers	2
At the finishing stage of the project	0
Towards project-handover	0
Anytime	1



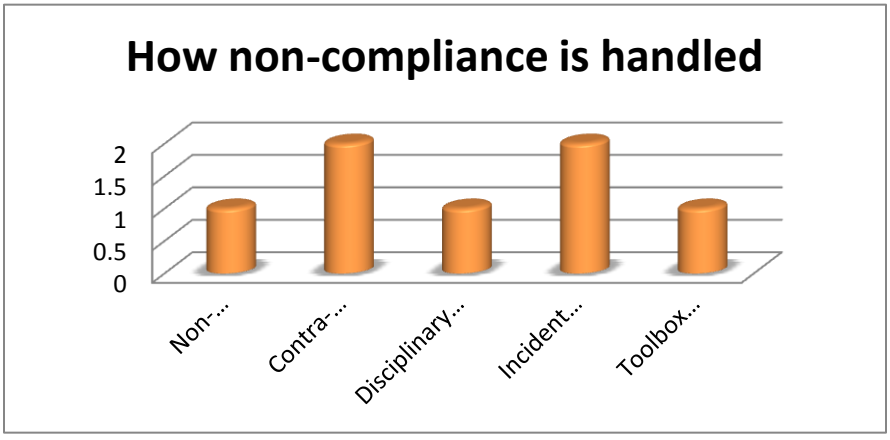
13. What corrective action is taken once incidents occur?

Re-training	1
Review of the H&S plan/system	2
Increased supervision	1
Incident investigation	3
Disciplinary hearing	1
Toolbox Talks	2



14. How is non-compliance by principal and sub- contractors handled on site?

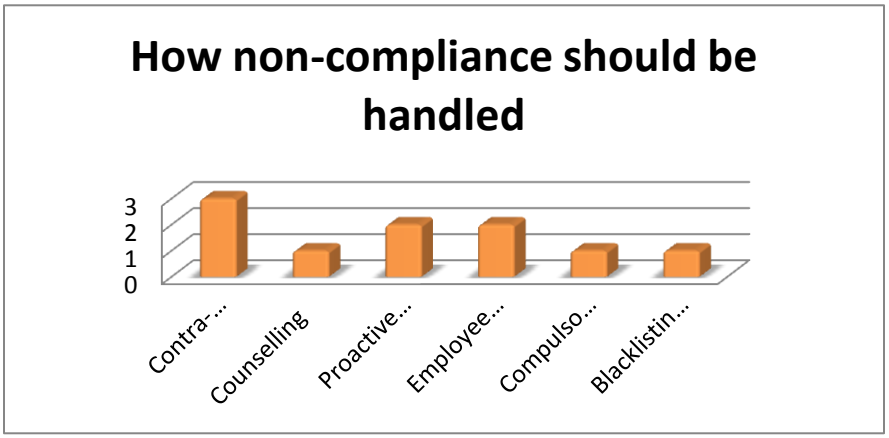
Non-conformance Reports are compiled	1
Contra-charges or Fines	2
Disciplinary hearings	1
Incident Investigation	2
Toolbox Talks/Communiqués to site	1



15. How do you think non-compliance should be handled?

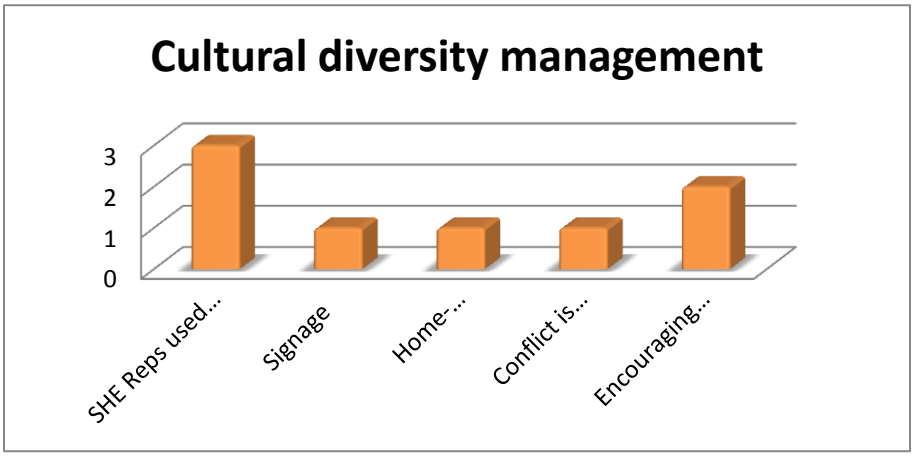
Contra-charges or Fines	3
Counselling	1
Proactive supervision and attendance on site	2

Employee suspension	2
Compulsory SHE rep. appointment per contractor	1
Blacklisting contractors	1



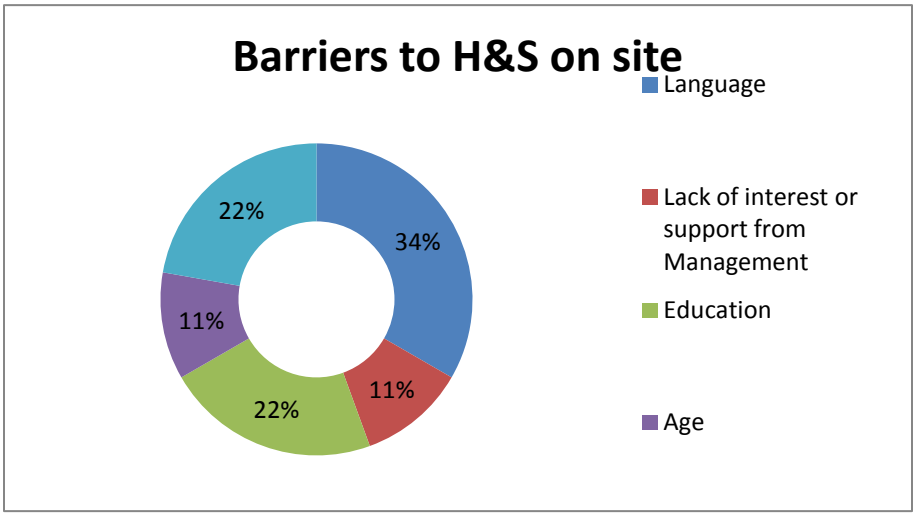
16. How is cultural diversity, with resepct to H&S, managed on site?

SHE Reps used to communicate information	3
Signage	1
Home-language used for completion of risk assessment	1
Conflict is dealt with immediately	1
Encouraging employees to speak their home language	2



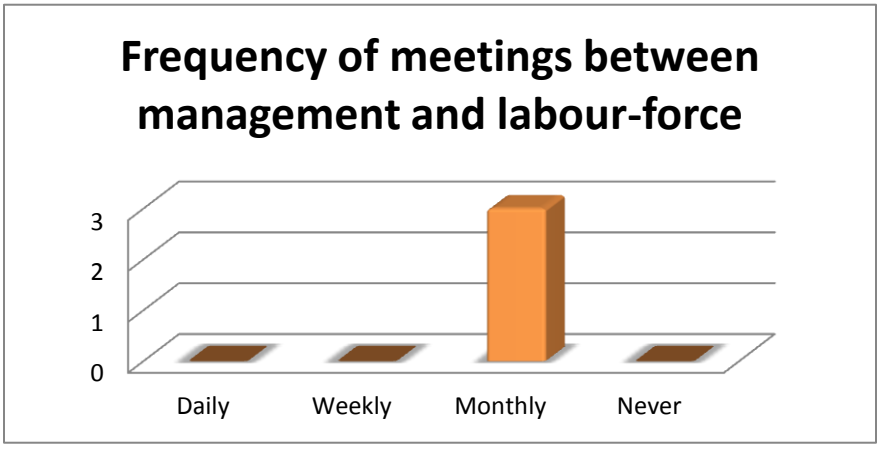
17. In your opinion, what are the main barriers to understanding H&S on site?

Language	3
Lack of interest or support from Management	1
Education	2
Age	1
Production (priority)	2



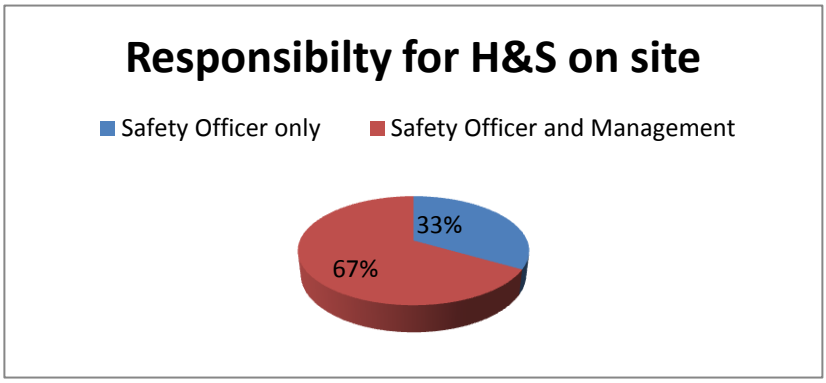
18. How often do Management and labour-force meet to discuss H&S matters?

Daily	0
Weekly	0
Monthly	3
Never	0



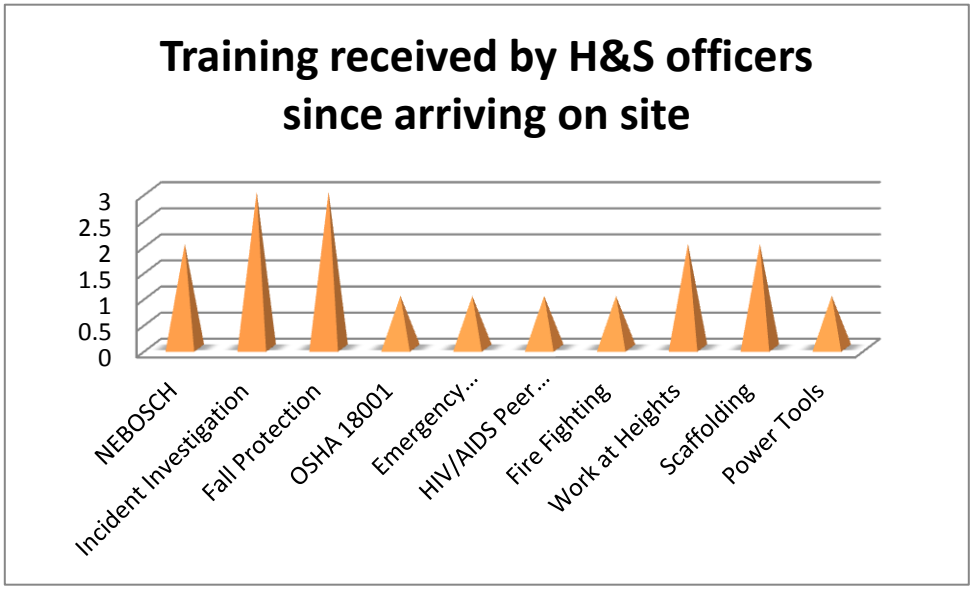
19. Who is chiefly responsible for safety on site?

Safety Officer only	1
Safety Officer and Management	2



20. What training have you received since working on this site?

NEBOSCH	2
Incident Investigation	3
Fall Protection	3
OSHA 18001	1
Emergency Coordination	1
HIV/AIDS Peer Education	1
Fire Fighting	1
Work at Heights	2
Scaffolding	2
Power Tools	1

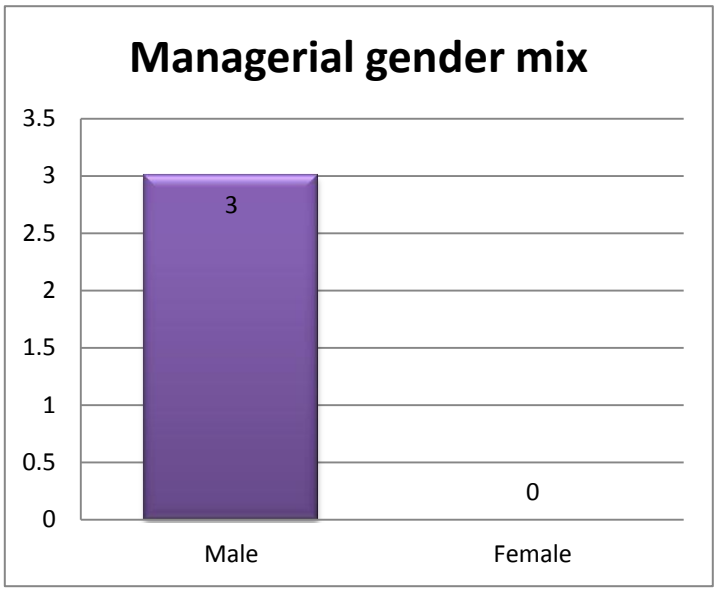


APPENDIX F

Data Analysis - Management

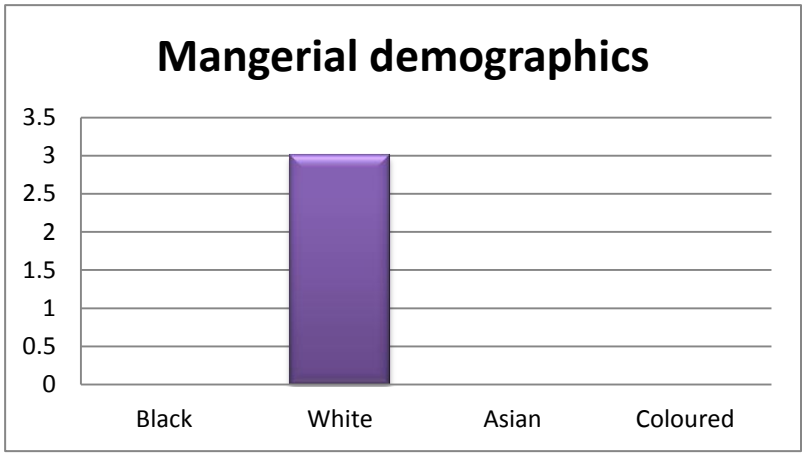
1. Are you…

Male	3
Female	0



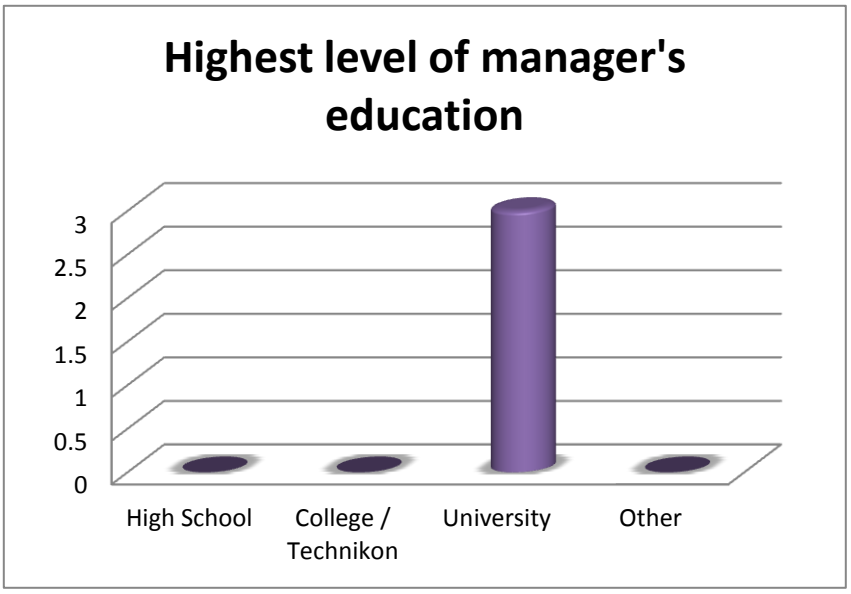
2. Please indicate your race

Black	0
White	3
Asian	0
Coloured	0



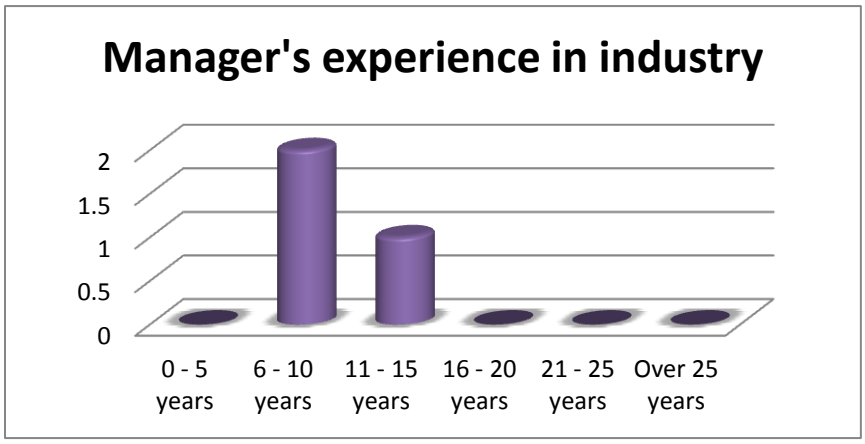
3. What is your highest level of education?

High School	0
College / Technikon	0
University	3
Other	0



4. How long have you been working in the construction industry?

0 - 5 years	0
6 - 10 years	2
11 - 15 years	1
16 - 20 years	0
21 - 25 years	0
Over 25 years	0

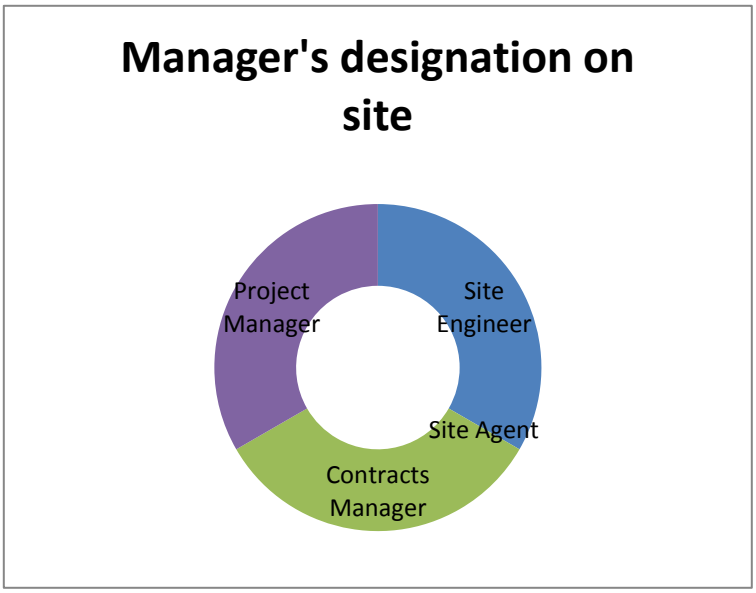


5. How long have you been working with your current company?

0 - 5 years	0
6 - 10 years	3
11 - 15 years	0
16 - 20 years	0
21 - 25 years	0
More than 25 years	0

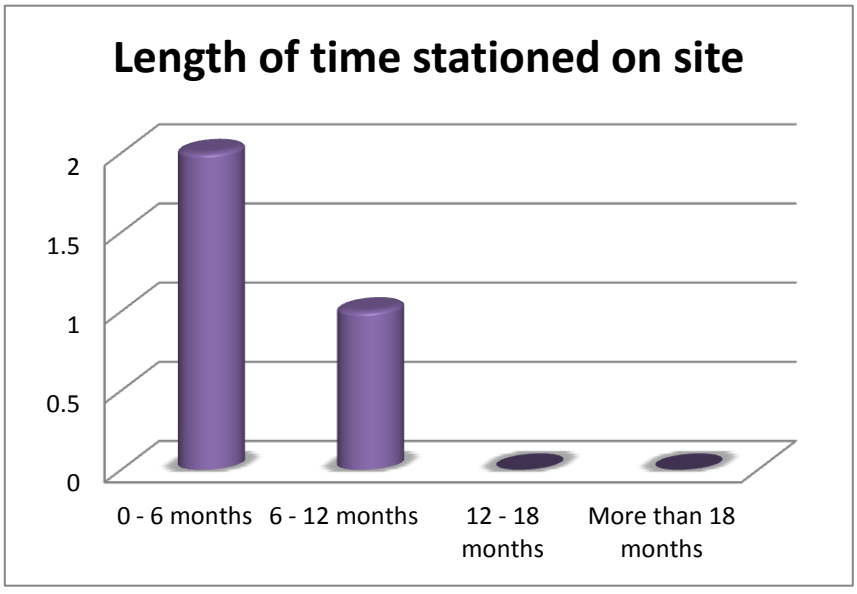
6. What is your desigation on this site/project?

Site Engineer	1
Site Agent	0
Contracts Manager	1
Project Manager	1



7. How long have you been working on this site/project?

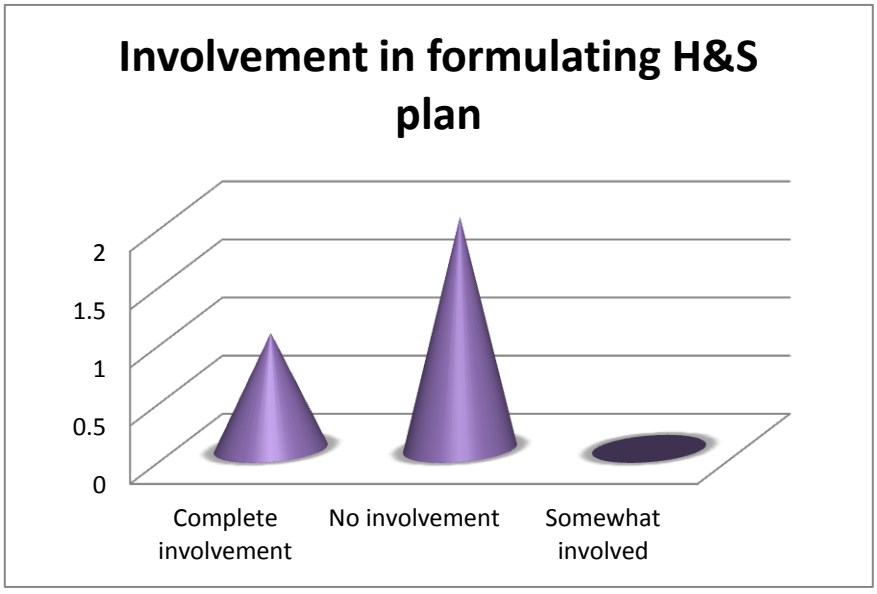
0 - 6 months	2
6 - 12 months	1
12 - 18 months	0
More than 18 months	0



Were you involved in formulating the safety plan for this site/project?

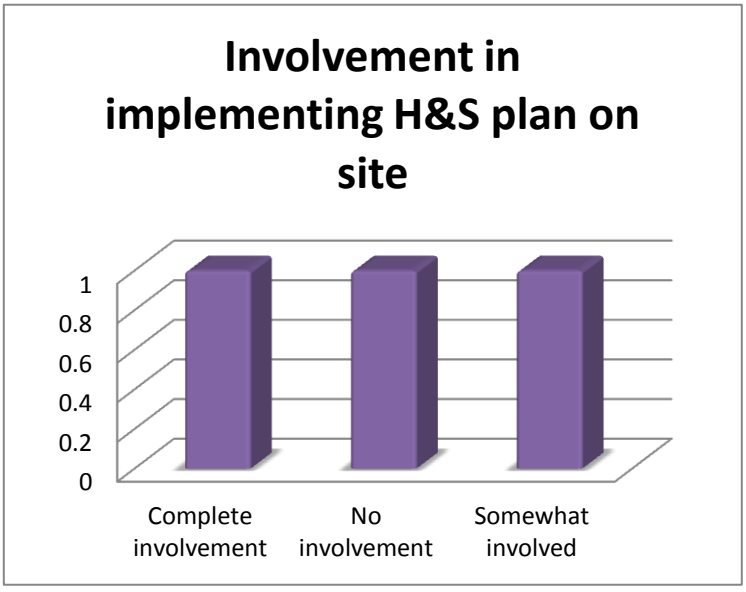
Complete involvement	1

No involvement	2
Somewhat involved	0



9. Were you involved in implementing the safety plan on site?

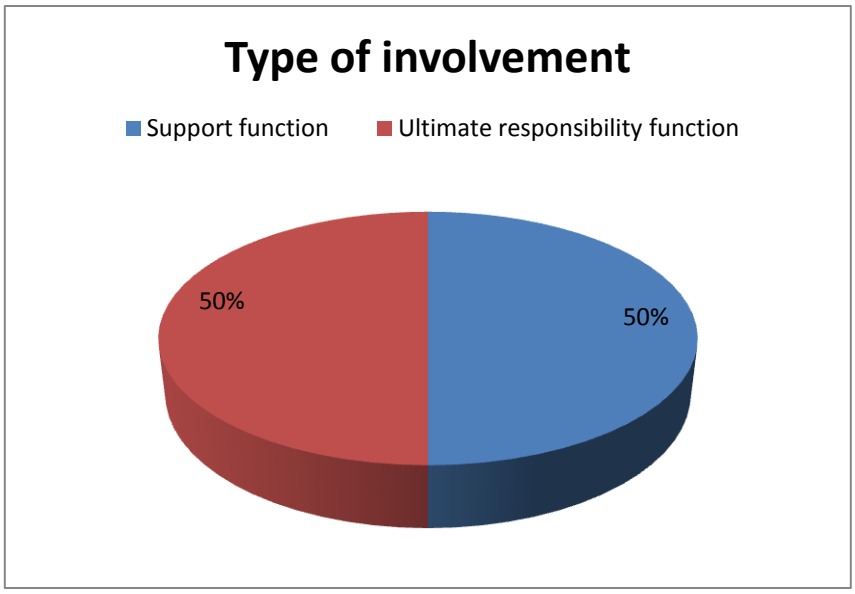
Complete involvement	1
No involvement	1
Somewhat involved	1



10. Please indicate the extent of your involvement (in the implementation of the

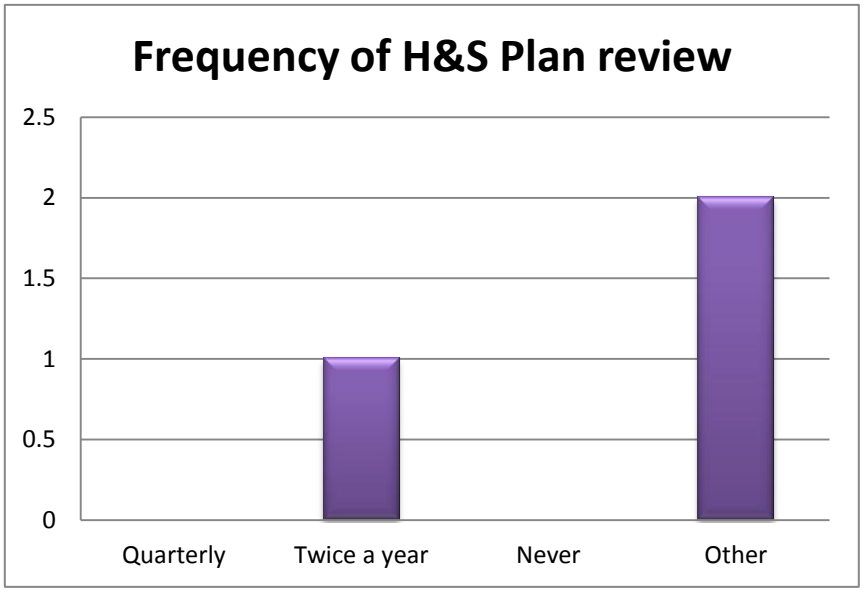
safety plan on site)?

Support function	1
Ultimate responsibility function	1



11. How often is the safety plan reviewed?

Quarterly	0
Twice a year	1
Never	0
Other	2

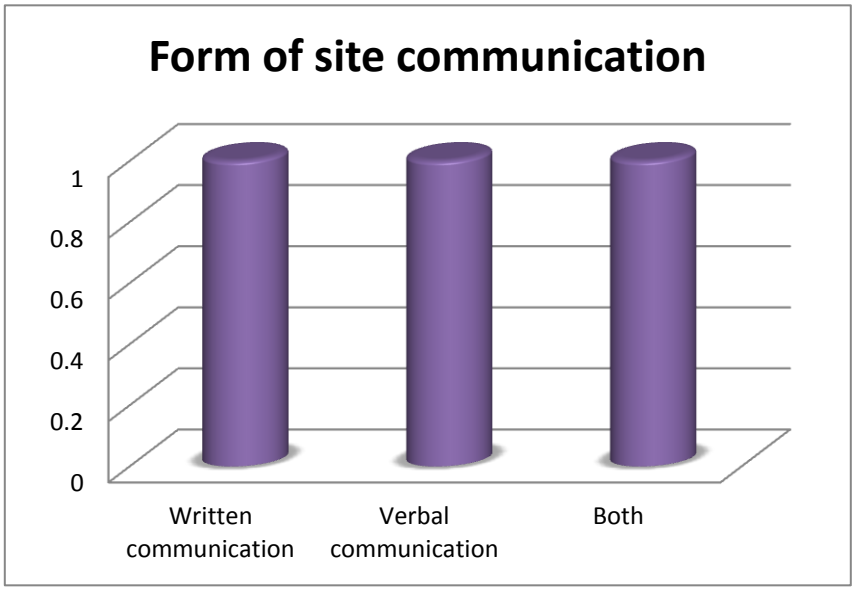


12. What are the advantages of reviewing the safety plan?

Relevance	2
Tracking changes	1
Identifying dangers or short-falls	2

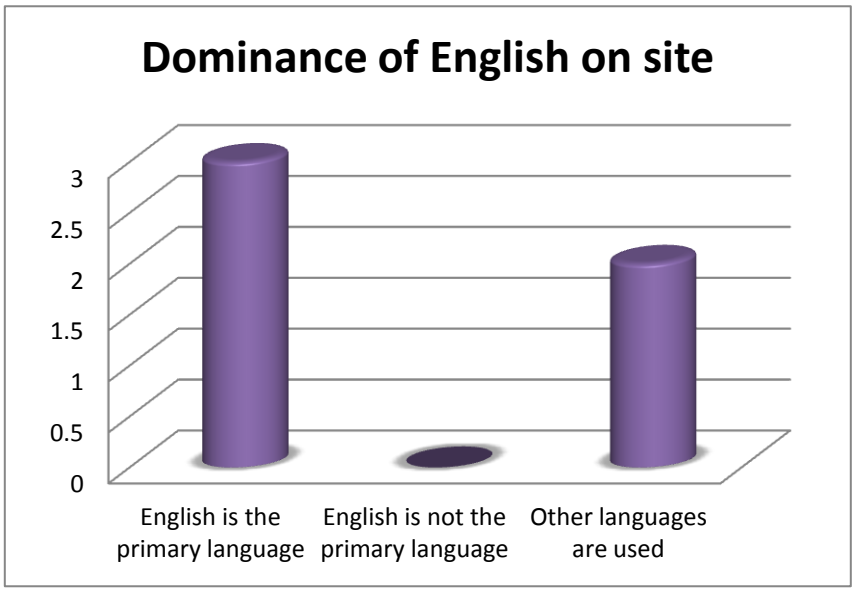
13. How do you communicate with staff on site?

Written communication	1
Verbal communication	1
Both	1



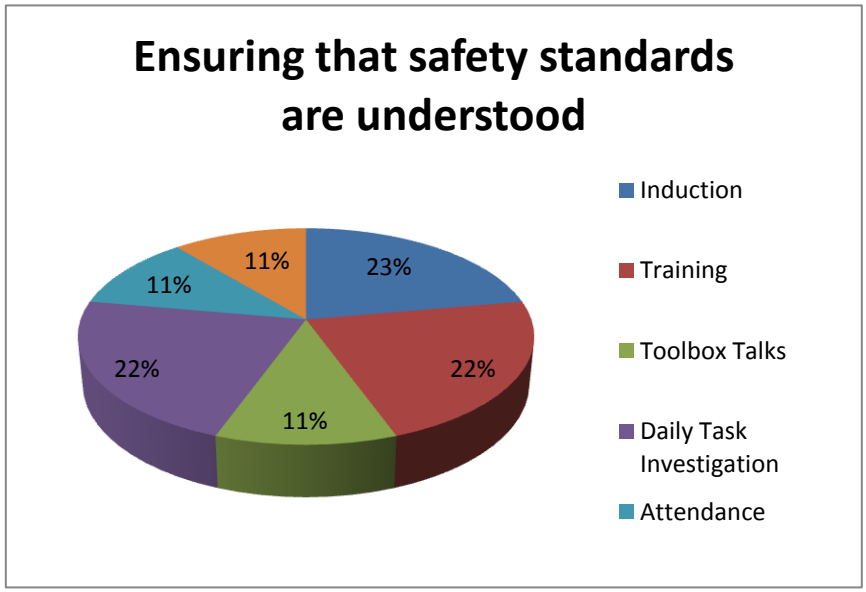
14. Is the primary language used on site English?

English is the primary language	3
English is not the primary language	0
Other languages are used	2



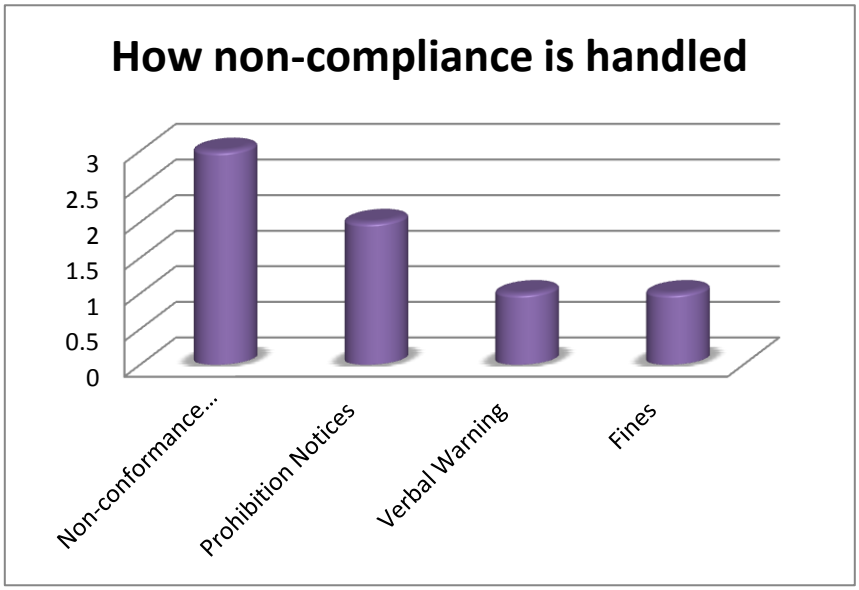
15. How do you ensure that every employee on site understands safety and its standards?

Induction	2
Training	2
Toolbox Talks	1
Daily Task Investigation	2
Attendance	1
Safety Committee Meetings	1



16. How is non-compliance by your own staff as well as subcontractors handled?

Non-conformance Reports	3
Prohibition Notices	2
Verbal Warning	1
Fines	1



17. Please rate the following as per these indicators

High health and safety standards have a positive effect on project morale and the successful delivery of the project

All site stakeholders are equally responsible for safety on site

Health and safety training is good practice and ensures good site safety records

Taking preventative action negates the need for taking corrective action once incidents occur

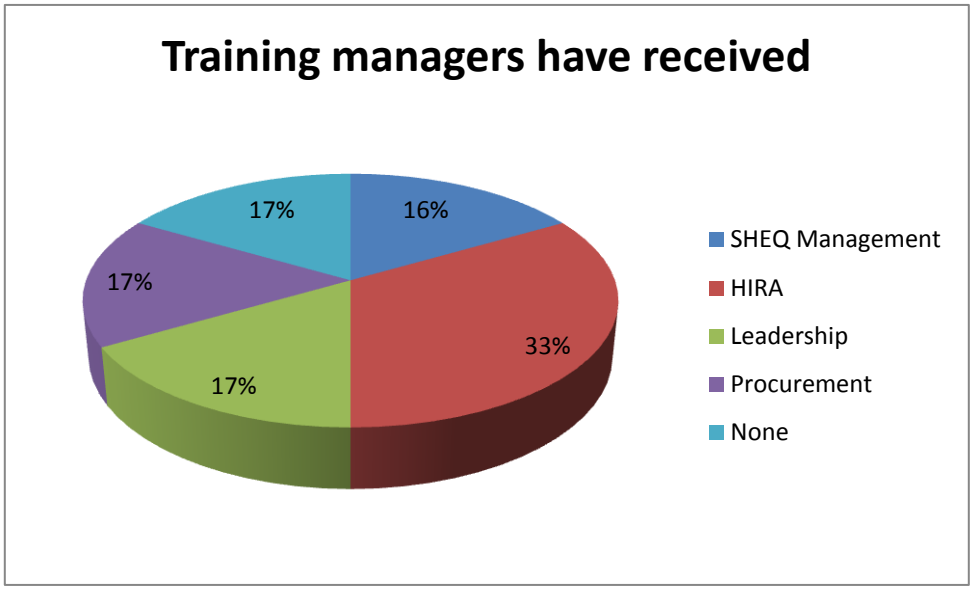
Enforcing compliance enables the successful delivery of the project

18. Is the management of safety an expensive task?

Safety management is expensive	1
Safety management is not expensive	2

19. What training have you received since arriving on site?

SHEQ Management	1
HIRA	2
Leadership	1
Procurement	1
None	1



20. How can the management of safety be made easier, from a practical point of view

Zero-tolerance attitude applicable to all	2
Training	2
Improve communication across all levels	1