CHAPTER ONE

Introduction

Safety and health in the workplace have become an integral component to the viability of business for employers, labour unions, governments, and environmentalists in general (Macintosh and Gough, 1998; Anderson and Gough 2004). Naturally a need for safety is an intrinsically human concern. Every individual in life, whether one is employed or not, both at the workplace and outside the workplace has the intrinsic need to be safe. Workers, as mature individuals, are responsible for every decision they make with regard to securing their own health and safety in every social setting (Bennet, 2002). This paper advances the view that workers play a central role in the creation of a workplace environment and that through their unions they exert significant influence in their workplaces. Dryzek and Schlosberg (2005) argue that “Environmental justice demands the right to participate as equal partners at every level of decision making including needs assessment, planning, implementation, enforcement and evaluation” of workplace conditions.

The International Labour Organisation (ILO),that acts in the interests of the workers, embraces the idea that workers’ points of view need to be heeded and given equal status with those of other stakeholders in the workplace in ensuring sound business development. Bennet (2002) argues that workers, unlike tools or objects of production, are living human beings that need to be

involved in the improvement of working conditions and should participate at all levels, including international levels, on issues that affect their livelihoods. Workers' perspectives need to be considered in devising and carrying out health and safety measures at the workplace (Bennet; 2002)

Due to globalized economic trends, the subject of safety in the workplace has taken on such importance that international conventions instituted the international organisation for standardization to help regulate and bring about improved workplace conditions and services (Zwetsloot 2003). The subject of safety and health in the workplace covers a wide spectrum of issues. Among them are issues such as

- Working with hazardous chemicals and minerals (Armour, 2003).
- Exposure to contagious diseases and passive smoking (Gwandure and Thatcher 2006, Roger 1999).
- Psychological safety such as stress, fears and attitudes (Baer and Fraser 2003).
- Psychosocial safety such as indifference, xenophobia, homophobia and lesbophobia (Gillen *et al.,* 2002).
- Criminal and sexual harassment in the workplace (Kong R 1996; Hatch-Maillette and Scalora 2002).
- Working within harmful workplace emissions (Profumo *et al.,* 2003).
- Manufactured and manufacturing of harmful substances and innovations (Valent *et al.,* 2003).

- Harmful infrastructural constructions such as unsafe stairways, unsafely built structures and slippery floors (Mehta and Burrows, 2001).
- Terroristic intrusions and massacres in the workplace (Miller, 2001) and
- Safety precautions, safety communication measures and personal protection equipment (Tan and Fitzgerald, 2002; Henshaw, 2007; Mearns *et al.,* 2002).

This study focuses on the safety precautions, safety communication and personal protective equipment (P.P.E) and reflects on how workers at shop floor level relate to, engage with and respond towards the occupational safety and health administration measures thus contributing to own safety and health and those of others in the workplace.

Conceptual Framework

The study follows a Postmodernist theoretical framework which emphasises differences. It is a fact that the workplace is a heterogeneous place comprising of people who come from different backgrounds, different social strata as well as different world and life views. Postmodernists point to differences as of prime importance in representing any aspect of reality in the world. The Postmodernists believe that varied social practices are differently constituted in different places, and form what Soja terms an 'interjacent medley' (Soja cited in Johnston and Sidaway: 2004). This holds good for workplace conditions too. In dealing with human factors, one needs to take

into consideration the aspect of human difference as it plays a major role and forms a central part in every event in the workplace.

The study also makes use of the Environmental Justice (EJ) theoretical framework as the central theme it is informed by the view that the participants in the workplace environment must be centrally involved in ensuring a safe working environment. Section 24 of the Bill of Rights of the South African constitution states that everyone has a right to an environment that is not harmful to their health or well-being. It further endorses one's right to refuse to work if the working conditions are not conducive to carrying out one's duties without endangering oneself. Environmental justice upholds the right of all workers to a safe and healthy work environment, without being forced to choose between unsafe work and unemployment. EJ holds that one life lost is one too many (Dryzek and Schlosberg 2005).

Literature Review

The literature on workplace safety and health administration reveals that much of the subject has been covered in different parts of the world. The ground thus covered tends to focus predominantly on disease prevention, psychosocial factors at the workplace, safety concerns at the workplace, workplace politics, workplace spirituality, epileptic medication at the workplace, safety climate at the workplace, safety management, Exposures to chemicals and perceptions of risks (Cha, *et al.*, 2006; Gandz and Murray 1980; Gillen *et al.*, 2002; Gold and Carbon, 2002; Grandey *et al.*, 2002; Henshaw, *et al.,* 2007.; Holness *et al.*, 2004; Millan, *et al.*, 2003; Mygind *et al.*, 2006; Ortiz *et al.*, 2000; WHO 2008).

In Africa studies on human perception and experience of environmental safety management are sparse. These studies tend to focus on behavioural qualities of the workers at the workplaces (Burton: 2006) and on issues such as occupational hygiene, global equity challenges, policies, problem solving, welding health hazards, health education, asbestos problems, responsibility assignment, health and safety and equity in the workplace (Asuzu,1998; Spee, 2006; Skinner, 2006;Loewenson, 2004; Jurdak and Shahin, 2001; Meo and Khlaiwi, 2003; Kuye, 2001Rantanen, 1997; Harris and Kahwa 2003; Gyekye and Salminen, 2005).

In South Africa workplace studies address issues of trade unions and democracy, job security and conditions of work, race and labour, workplace concerns, education and labour market as well as statistical quantities of studied variables.(Alexander and Halpern: 2004, Barret: 2005, Buhlungu 2006, Burns and Marshall: 2004, Lock and Munnik:200.., Lund and Ardington: 2006). In South Africa studies concerning to worker perspectives are extremely rare. It is this gap that this study seeks to fill by analysing workers' perceptions of occupational health and safety measures in the workplace.

Bennet (2002) argues that when it comes to workers' views on occupational safety and health in the workplace they are often ignored due to various management styles and a shortage of safety regulations, allowing for little reflection for worker contribution. Workers as subordinates often find themselves compelled to simply comply with and submit to rules and policies already in place at the workplace. He believes that workers' perceptions on

the subject are seldom considered. He states that in many industries, the plight of workers is left in the hands of health and safety professionals, industrial hygienists, academics and industrial managers. Bennet (2002) argues that the concerns of safety and health management are aspirations arranged in point form to be met by management as envisaged goals. He argues that management systems are always silent as to how safety and health at the workplace looks like, how it is structured, how it functions, how it relates to the management of the enterprise in general and how it is reconciled with the functions and responsibilities of other parties. He argues that the workers are not objects to be managed like machines or other factors of production. They are living, breathing and thinking human beings who have the most fundamental stake in any system of health and safety that affects their lives in workplaces.

Bennet (2002) finds the ILO approach towards safety and health in the workplace ideal since it seeks to benefit the workers who are always vulnerable to occupational incidences by advocating that total safety and health specifications should be given priority over performance standards. He argues that pursuing performance standards does not have the safety of workers at heart and pursues a goal other than the total safety of workers is to keep the establishment going. He maintains that performance standards contain no specific objectives and thus are not measurable.

Bennet (2002) argues that ISO voluntary standards are mainly focused towards the performance of the business. He believes that ISO standards

simply enjoy the World Trade Organisation endorsement and are pro-production rather than pro-human life. He argues that for a person who is doing routine work with a specific target to meet per day, the prime factor for management is to meet the target rather than to ensure the individual's health, whose stress levels could adversely impact on the operation of the company. He argues that management's views towards environmental health and safety are production oriented. He states that ISO standards simply address matters of policy, planning and implementation, measuring performance, audits, checking, corrective action and management review but are silent on worker perspectives.

Bennet (2002) argues that industrial hygienists simply concern themselves with auditors, disability management and insurance matters rather than with workers' safety and health. He believes that industrial managers simply focus on issues of quality assurance, productivity, cost benefit and continual improvement rather than on quality of life. Smith (1973) cited in Johnston and Sidaway (2005, 329) believes that applied geography needs above all to prioritise "human welfare before economic welfare, equity before efficiency and quality of life before quantity of goods". Reflecting on academics' works, Bennet (2002) states that academic texts merely consider the intellectual background of health and safety management. He states that academic literature affirms that in industry, product quality tends to supercede worker health( ). He also claims that academic texts tend to focus more on worker behaviour than on the actual worker's safety and health.

Various studies indicate that level of education influences worker health and safety in the workplace. Graham (2004) writes that education helps to provide the appropriate skills needed to achieve social status and make healthy lifestyle choices. She writes that studies exploring adverse health effects of the psychosocial work environment show that individuals in positions that are characterised by routinized work with little supervision have low self esteem and higher stress levels. This leaves them prone to workplace hazards and leads to adverse effects on production by way of absenteeism. Workplaces, argues Graham (2004) can exert either a positive or negative influence on worker behaviour. She argued that the risk of death before reaching retirement age was two and a half times higher for men and women in unskilled occupations than for those in professional positions. Her findings from an extensive Finnish study using education as a measure of socio-economic status are that both men and women the most highly educated tend to live longer and have more disability-free years than their less educated counterparts. She also found a number of American studies to show that those with less education run greater risks.

Parboteeah and Kapp (2007) in their study of ethical climates and workplace safety behaviour found that egoistic behaviour relates positively to injuries and negatively to safety in the workplace. They also discovered that benevolence and principled attributes relate negatively to injuries but positively to safety enhancing behaviour in the workplace. This suggests that the life style of an individual significantly affects safety and health in the workplace.

A study highlighting statistics gathered from Namibian workplaces on common causes of workplace incidents revealed that the most common incidents at the workplace occur more often due to ordinary negligent human activity than use of dangerous machinery and substances (Amweelo, 2000). This also indicates the significance of the role played by individual workers in ensuring safety and health in the workplace.

With regard to compliance with regulation it has been noted that regulatory bodies simply function on a state mandate, and base their work on law and policies. In essence this ought to be in support of human welfare, yet in practice it is deficient. In a country like South Africa where industrial development has been built on severe environmental injustice, regulation is practically ineffective. Even in the post-apartheid era little has been done to rectify the environmental inequities that have characterised the industries for so long. Hallowes and Butler (2003) state that in South Africa agriculture and industry were virtually unaffected by environmental regulation as the actual basis of colonial and apartheid policies continued unabated.

Parker (1999: 215) writes that the corporate veil frequently wards off the penetration of standards into the corporate world and prevents the imposition of legal sanctions. She states that “adversarially trained lawyers often facilitate avoidance and evasion of corporate liability through creative compliance with legal requirements”. She also states that a commonly preferred solution to the problem of ensuring that values permeate the internal

working of corporations is to require large institutions to regulate themselves, which is often found to be effective by some and problematic by others. Lukey (cited in Hallowees and Butler; 2003) states that “Most workers tend to prioritise access to wages over labour conditions. This places them in an ambiguous position resulting in them compromising their lives as victims and risking their lives in the workplaces. “(cited in Hallowen and Butler: 2003). If so it could mean that towards or on pay-days, workers’ behaviour might change and affect the state of safety and health so as to have an impact on workplace safety conditions. It could also mean that the first working days or two after pay-days negatively affect attitudes on workplace safety conduct, depending on individual ethical moral mind-set (Hayes et al., 1998).

This raises a concern as to value; what is valuable to the workers might not coincide with what is valuable to the company. The objectives of the company might be totally different to those of the workers (Magendaz, 2004). This would have a bearing on compliance with rules and regulations put in place by the establishment. Winter and May (2001) reflect on three types of decision making forces that have influence on compliance with laws and regulations as follows;

- Calculated motivation; when regulated entities comply with a given regulation having calculated the cost of non-compliance in their decision making; this type is governed by enforcement and deterrence;
- Normative motivation; this derives from the regulated entities’ combined sense of moral duty and agreement with the importance of a given

regulation as an internalised value.

- Social motivation; which derives from the regulated entities' desire to earn approval and respect from people with whom they interact.

Basically industries do whatever it takes to safeguard the credibility and integrity of their establishment. Industry in the current era cannot afford to neglect safety and health factors at their workplaces and to so bring their establishment and production into disrepute. Hence measures such as ISO standards are put in place by well established industries to ensure sound and systematic safety and health administration in their workplaces; a typical example of calculated motivation; to comply.

This study seeks to explore workers' perceptions towards OSHA measures at the workplace. It seeks to probe into the subjective rationale behind the workers' compliance and decision making with regard to health and safety in the workplace. The study seeks to discover how workers perceive OSHA measures at Sasol in relation to their own health and safety in the workplace.

Problem Statement

Sasol, like all South African companies, employs the globally accepted OHSAS 18001 regulatory standard for safety and health administration in the workplace. The OHSAS 18001 workplace regulation runs parallel to ISO 18001 standards. ISO 18001, as an administrative tool, is declared to be an ideal tool for occupational safety and heath management worldwide in various industrial companies. Achieving the voluntary ISO standards accreditation is

an expensive endeavour calculated in millions of US dollars. Potoski and Prakash (2005) state that the initial auditing by a third party cost between 25 000 and 100 000 US dollars while the actual initial implementation costs range between 250 000 and 1000 000 US dollars.

These costs exclude the ISO standards maintaining costs. This implies that not all companies can afford subscription to the voluntary ISO standards. These are endeavours taken by major industries throughout the world to ensure safe and healthy workplace environments by well established companies globally. These are resorted to by establishments who take safety and health factors to be of concern at their workplaces.

The World Health Organisation (WHO) (ILO, 2005) noted with concern that 1, 7 million people worldwide die annually of work related injuries and illnesses. 268 million non fatal workplace incidents and 160 million work related illnesses (ILO 2005). The WHO states that an additional problem to the situation of workers in African countries is the high prevalence and incidence of the H.I.V. / Aids pandemic (ILO, 2005). These numbers are so huge that they have serious implications for environmental justice (EJ), be it from the employers' or employees' side. It is worrying that such a high number of incidences occur in the 21st century era when advanced scientific technological intervention is possible all over the World.

In South Africa more than 300 000 incidents are said to take place every year. Given the lack of accurate figures the number could be much higher (Bell;

2007). In South Africa the mining sector takes the lead in workplace incidents and Sasol has been no exception in some of its operations around the country (Peek and Cohen 2004).

This paper advances the notion that not withstanding the efforts of management in ensuring a safety regime, however lucrative occupational safety and health measures put in place may be, it is always going to depend on each individual worker to really ensure a safe environment for himself/herself and others in the workplace. This is due to the roles and capacities inherent in individuals to choose to either act as cooperative or non-cooperative individuals in ensuring a safe and healthy workplace environment wittingly or unwittingly. The South African workplace legislation also states that it is the duty of every individual to ensure his or her own safety as well as that of other co-workers in the workplace (LexisNexis, 2007). This is the perspective from which the study derives its purpose, to probe into the role workers fulfill in engaging with OSHA measures to ensuring a safe and healthy workplace environment.

The Aim of the Study

The aim of the study is to probe into and discover the subjective perceptions of workers towards occupational safety and health administration (OSHA) measures that are employed at the workplace.

The Objectives of the Study

The study seeks

- To look at the workers level of understanding of the OSHA measures

that are applied at Sasol.

- To evaluate the workers' level of vigilance in securing their personal safety and health in the workplace.
- To survey the workers' subjective attitudes towards Sasol's OSHA measures.
- To examine the extent to which workers take ownership of the OSHA plans at Sasol.
- To assess the workers' compliance with the OSHA stipulations of Sasol.

This study endorses the view that workers' perceptions do influence their attitudes, compliance and general acceptance of the safety regime and thus their perceptions will, to a greater extent, play a significant part in shaping the workers' behaviour in ensuring a safe and healthy workplace environment for themselves and fellow workers in enhancing the reputation of the company they are serving.

Methodology

The study explores the subjective perceptions of workers at the workplace that have a bearing on their decision making in ensuring a safe and healthy workplace environment. It employed qualitative research techniques to arrive at the purported objectives. It has applied triangulation using one on one interviews, a focus group and participant observation. The sampling of the population was done by systematic stratified random sampling involving the various business units of the company. These include Sasol Infragas, Electrical Operations, Steam Stations, Laboratories, Silog, Water & Waste, P

& SM and AMG The semi-structured questionnaire was based on Sasol's safety induction course.

The safety induction program, like other safety programs at Sasol, undergoes continuous modification. Various individuals interviewed entered the company at different stages. This might have had some influence on the findings of the study. The studied objectives were based on the current safety proceedings. This may have placed experienced individuals at an advantageous position since they go through the safety induction procedure every other year. This is offset perhaps by fact that the later employees have gone through the most recent safety induction program.

The researcher initially intended to involve 50 respondents or more but not less. The company requested that the study be carried out throughout all eight business units of Sasol Infrachem. The interviewees for the study totaled 64 people, eight individuals being selected from each of the eight business units of Sasol Infrachem. The scheduled duration for the one on one interviews was five business days. This proved to be unworkable due to the unavailability of respondents at the scheduled times. An extension of the study duration of five days was requested and granted. Ultimately the study could not be carried through for all 64 candidates; instead, 61 interviews were conducted with time constraints preventing 3 interviews. The interview duration with each respondent varied from the intended twenty minutes to fifty five minutes. Some respondents who were kept waiting lost patience due to this unforeseen circumstance. Eight respondents from six business units were successfully interviewed. For the other two business units AMG and Steam Stations seven

and six respondents respectively were interviewed instead of eight. The interviewed respondents' work experience at Sasol varied from one month to forty years of work experience.

The Study Location

This study was conducted at Sasol, in Sasolburg, as a single case study. Sasol is a South African Petrochemical Industrial company that was established in 1950 for the manufacturing of synthetic fuels and chemicals from low grade coal extracts. It is important to note that Sasol has operations in various countries all over the world. The company specialises in the conversion of natural gas to fuels; recently it has expanded its operations to explore for oil and gas in Mozambique. The Sasol plant in Sasolburg is found at the border of the Free State and Gauteng provinces, on the banks of the Vaal River, lying on the side of the Free State province in the Republic of South Africa (see figure 1. Page 17).

Due to the manner in which the company operates safety and health measures are prioritised goals, as expressed in the Sasol proactive mission statement. The company claims to go above and beyond what is legally required by regulation. The aim of the company is to ensure a continuous progress towards a vision of no accidents, injuries or harm to the environment and to lead Sasol companies ethically for the growing benefit to society, the economy and the environment www.sasol.com. (2007).

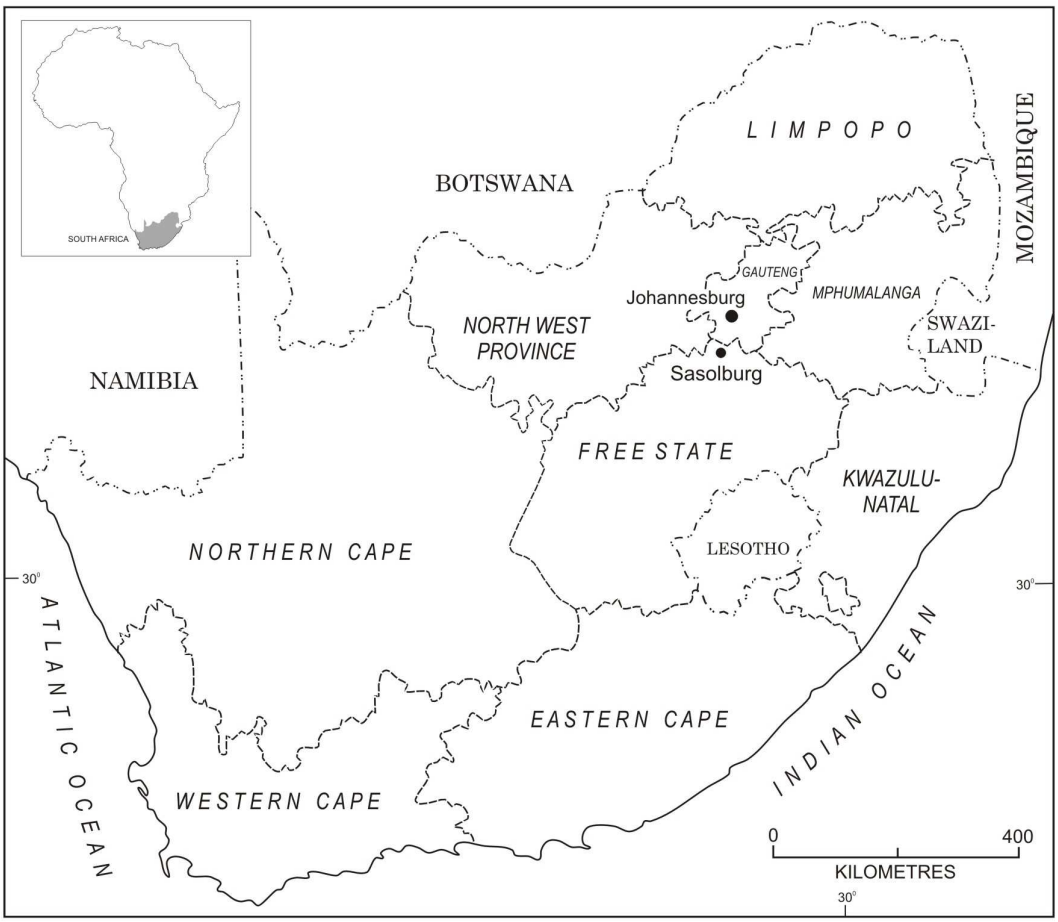


Figure 1. Sasolburg in South Africa

The Significance of the Study

The study contributes to the existing body of knowledge in the field of occupational health and safety sciences. The outcomes of the study reveal how differently workers construe the OSHA measures at Sasol. It has helped establish the part played by the workers with regard to vigilance in ensuring their safety and health in the workplace. The study has established the workers' varied levels of understanding of the OSHA measures of the company and pinpoints the gap that needs to be filled by the company for those who need additional training with regard to certain aspects of the OSHA

measures of the company. Aspects that have been raised by the workers help trigger points of concern to the workers that can help Sasol improve its safety system. It helps pinpoint some safety aspects that the company could have never thought of pertaining to crucial elements of the OSHA measures of the company. It puts safety officials in the position to consider the responses and identify strengths and weaknesses of its safety program. It puts the company in a better position to reinforce major elements of their safety program such as the pre-shift safety talks. It has helped to identify the differences in worker perceptions with regard to various safety regulations that are perceived differently by workers and that may in part obstruct the company's objective.

The study has revealed how workers put their trust and value in the safety program of the company. The findings can help the company strengthen some of the weaknesses and capitalise on the strong points of the company to provide missing information. The study also suggests ways in which to impart some of the safety regulations systematically to ensure uniform understanding and action in step with the OSHA measures. Moreover the study has also pinpointed the role that individual differences can and do play with regard to safety in the workplace no matter what the set strategies. It may help to put the company in a better position to implement of the OSHA strategies in the future.

Conclusion

Safety and health in workplace has become of prime importance. Well-being and health are fundamental human rights that cannot be ignored by the

business world. The reviewed literature has confirmed this in unequivocal terms. The subject of safety and health in the workplace is very wide and can be viewed from various perspectives. In this thesis work, this subject is focused on communication of safety and health, safety and health precautions and equipment. The industry is accountable for the greatest loss of human life in the world as confirmed in the literature. This impacts directly to environmental justice and thus has become a subject of global concern. In South Africa it is constitutionally unacceptable. Shop floor workers are at the most vulnerable position at workplaces. In spite of safety and health measures put in place at workplaces, incidents continue to take place. This is the premise from which the study has emerged and endeavours to explore the subject by employing qualitative research techniques to workers at a petrochemical plant Sasol in Sasolburg. The next chapter will focus on the origins of the company and its political background up to its present state.

CHAPTER TWO

The Location of the Study

This chapter deals with the physical location of the study area. The origins and the purpose behind the development of the Sasol plant are considered, from their local, regional, provincial, national and international significance. The role played by the South African Nationalist Party was to uphold and protect the apartheid system and to ensure its sustained success against all odds, to enjoy and reserve the wealth of the country exclusively for the benefit of the white population of the country. The development of Sasol has been to a greater extent in pursuit of the sentiments of the ruling party of that time.

For Apartheid South Africa to develop effectively it had to ensure by all means a state of self sufficiency. As a country without crude oil reserves within its borders the country had to import crude oil from the Middle East in order to acquire oil to maintain its economy. This is one of the reasons that drove the South African government to exploit its coal resources to produce oil (Leonard, 2006).

Sasol was founded in the Vaal triangle region, an area that was specifically designated to be the country's industrial base, located 80km South of Johannesburg (Figure 1). The region occupies both sides of the Vaal River bank, with Vereeniging and Vanderbijlpark on the Gauteng side of the river

while Sasol is on the Southern side of the river in the Free State Province. The whole area consists of dry flat plains of the Highveld region of South Africa. The region is rich in coal resources that were discovered near Vereeniging by George William Stow in 1870 (Dowson *et al*.,1994). The coal resources in the area led to the establishment of the Lethabo Power Station of Eskom near Vereeniging. The industrial demands in the area led to the construction of the Iscor (now Mittal Steel) steelworks company located 8 km to the west of Vereeniging and the development of the town of Vanderbijlpark in 1949. Five years later, in 1950, the region saw the development of the Sasol plant at the place that would later become known as Sasolburg 12 km South of Vanderbijlpark and 14 km from Vereeniging (Norman and Whitfield, 2006).

South Africa has been mining coal along both sides of the Vaal River dermacating the Free State Province to the south from the Gauteng Province to the north. Until 1994 these provinces were known as the Orange Free State and the Transvaal respectively. The South African government first announced its interest in coal gassification as early as 1927 with the influence of Dr F Meyer in parliament, who was then a technical advisor to the Department of Commerce and Industries of South Africa (Gerrans, 1999).

In 1925 the German chemists Professor Franz Fischer and Dr Hans Tropsch discovered a scientific formula that could convert coal into oil liquids, a process that came to be known as the Fischer – Tropsch (F-T) technique, named after the two gentlemen. The F-T process capitalises on the tar that is

derived from coal gasification that helps in producing light, middle and heavy oils that are suitable for the production of various chemical products (Collings, 2002: 12). This technique was used to supply German tankers with fuel during World War II. Germany at the time was taking the lead with the F-T technique as the first country to produce petrol, diesel, wax and other chemicals from coal. The process had great economic prospects that were never explored after the war. Due to the expensive implementation and operation costs of the F-T processes, the technique lost popularity against cheaper modes of acquiring oil after the war period. Both the costs of structuring and running the F-T processes are very high. Crude oil acquisition and processing proved to be cheaper than F-T processing (Cambray, 2006).

It was Etienne Rousseau, an engineer, who played a pivotal role in the establishment of the Sasol Company. He was the Company's first employee and managing director. He inculcated amongst Sasol workers a culture of being task driven and taking pride in their achievement as owners of the plant. Rousseau was a M.Sc. graduate from the University of Stellenbosch whose interest was in synthetic oil manufacturing. He took a closer look at the German Fischer – Tropsch process of converting coal into oil fuels. His thesis was focussed on "The Sulphur Content of Coals and Oil Shale". This made him the ideal candidate to run the establishment of the Sasol plant (Gerrans, 1999).

Anglovaal, a mining company, conducted mining activity in South Africa and bought the rights to use the Fischer-Tropsch process from Germany in order

to fully explore coal's capacity and Anglovaal brought Professor Franz Fischer to South Africa in 1938 to inspect the coal quality to assess prospects of the country for the F-T CTL process and to give the process a kick-start. On the 26th of September 1950 Sasol One was established. Etienne Rousseau coined the acronym Sasol deriving it from South African Synthetic Oil Limited. Sasol signed a joint venture deal with Ruhrchemie Aktiengesellschaft and the Gesellschaft fur Warmetechniek known as the Arbeitsgemeinschaft (ARGE) for their designs and the right to use its F-T fixed- tube reactors and for their gas supplies (Gerrans, 1999).

On the other hand Sasol obtained the M.W. Kellogg Corporation's licensing for its patents and designs (Kuo *et al*., 1994). The ARGE was good at producing higher-boiling waxes, oils and diesel while the Kellogg processors excelled in producing high proportions of medium octane petrol and a wide range of chemical products. Through these mechanisms Sasol took a cleaner synthetic route to oil production than the traditional crude oil processing methods (Lunsche, 2004).

In 1949 Anglovaal lost interest in the CTL project. This left a big financial deficit for the company. The company's application for financial assistance had already been turned down by the World Bank.Now Sasol needed a strong financial backier to continue confidently. in order to take off with ease. A year earlier, in 1948, there had been a change in the political scene of South Africa that proved significant for Sasol's success. Sasol financial viability and

success. Sasol became a state owned project with a politically driven mission (Collings, 2002).

The Nationalist Party took over the government of the country in 1948. The policy espoused by the new government was one of political segregation, a system known as "apartheid," that was unpopular amongst the marginalised Black majority population of the country. This instigated political resistance against the order and gave rise to serious political resistance so much so that the African National Congress (ANC) gave rise to a military wing uMkhonto WeSizwe and wanted to be international sanctions to be imposed against the country (ANC, 1985).

The sanctions against the country mainly took the form of embargo which would weigh down the economy of the country and serve to weaken South African troops in their efforts to crush the liberation movements. The transportation of goods on roads, travelling, flying aircrafts, the air force, transport by rail, construction cartages, engineering plant operations, marine cargo, farming tractors, crop transportation and mining would come to a stand-still due to the embargo. At some point in time fuel rationing was necessitated due to dwindling oil reserves (O'Leary, 1985).

The South African army and the South African Police were the major instrument of the apartheid system against the military encroachments of the liberation armies. Diminishing the fuel supplies to the country would hamper military operations and provide greater scope for the advance of liberation

movement's armies especially the SA military operations in Angola and Namibia (the latter was known then as South West Africa). This is the political influence that actually accelerated Sasol's efforts to meet the oil demands of the country's economy by minimising the necessity of crude oil imports (ANC, 1985).

The country was willing to spend liberally towards the plants' success since its economy was at stake. The initial cost estimates for the construction of the plant, 13 million SA pounds (prior to the introduction of the Rand in 1961), escalated to 20 million SA pounds due to the weakening of the gold price. This figure was doubled by the end of 1955. The country's debt rocketed sky high. The impact of the embargo might not have been evident but the effects were felt by the government that sustained all the blows in defence of the economy. The SA Prime Minister P.W. Botha, in regret, lamented the loss of R22 billion spent due to the oil embargo between 1973 and 1984 (Knight, 2001;Leornard 2006). It took Sasol painstaking efforts to get the project running. To ensure success Sasol had to invest in the expertise of highly qualified chemists and engineers of international origin. This was unavoidable since such a process had no commercial prototype elsewhere in the World. It was the first of its kind ever built (Collings, 2002).

With coal for a feedstock, coal mining became of prime importance to the company so it introduced coal mining innovations in order to mine coal more efficiently; among them the continuous miner, directional drilling and the in-seam horizontal drilling procedure. The continuous miner is a remote

controlled apparatus operated by a single person remote from the sites being mined, operating a number of coal mining sites single handedly. It was comprised of a pair of head phones and a three dimensional screen that covered the eyes of an operator as well as a manual keyboard with operational buttons. This device was invented in South Africa by Sasol in joint venture with a company called Fifth Dimension Technologies in Pretoria. It enabled the operator to visualise every aspect of the mined site remotely as though the operator were physically there. In-seam horizontal drilling is ideal for long life span coal reserve mining. Directional drilling was designed by Sasol scientists and cost the company R9 000 000 to have one constructed. It allowed flexible drilling in any direction up, down, to the left or to the right with ease. It could operate non-stop for a period of six months, by remote controlled from the surface with modern computerised technology (Collings, 2002).

The establishment of Sasol One was not an easy task. It took Sasol four painstaking years before it could reap the first fruits of its labour. As the plant was a pilot project it was predominantly a trial and error exercise with serious pros and cons, successes coupled with calamitous workplace incidents, but the company director did was not deterred . Skilled jobs were strictly reserved for white people as espoused by the apartheid ideology. The Kellogg reactors manifested serious problems that included serious injuries and incidents fatal to workers such as fire bursts and explosions (Collings, 2002).

These problems emanated from catalysts forming in the reactor tubes, eroding quality of pipes, catalyst releasing slide valves, weak flanges and weak valves. Plant reactors and processors had to be replaced quite often during the construction stages. This was costly. These components could not withstand the pressure from the plant movements and heat. Extremely heated gas would escape. When this gas came into contact with atmospheric oxygen it burst into major fires which could not always be effectively extinguished. These incidents would cause the scientists to go back and plan afresh for better quality processors (Duvenhage and Shingles 2002).

"Explosions and deaths occurred at gasification and other units downstream from the reactors too" (Collings, 2002: 50). Many lives were lost in the construction of Sasol. Family members would be concerned about loved ones and next of kin at every work shift and wonder whether they would return back home alive or not from work. At any siren's wailing, men off-shift would rush to the plant to render necessary services to those injured and assist in putting out the fires. Women would panick and wait anxiously for long hours for phone calls from the company assuring them of the survival of their spouses and their safe return (Collings, 2002).

The operation of the company kept everyone on their toes both within and without the company. It was a costly learning curve for the company that experienced frequent shut downs in its first fifteen years of operation. These incidents raised heated debates in parliament led by the opposition party. In those days safety regulations in industries were not a prime issue of concern.

The focus was on production. With large sums of moneys already invested in the project there was no way that the government would easily abdicate and abort the project despite the opposition party's appeals (Collings, 2002). The first yield of production at Sasol was seen five years later in 1955 with the first fuel pumped into Etienne Rousseau's car. This was followed by the building of the first filling station in the vicinity to be supplied with Sasol fuel. The first Sasol filling station was built in Parys 45 km away, as the nearest town to the plant in the Orange Free State. Sasolburg was not yet established then. A few building structures began to develop near the Sasol plant in 1954 to meet the basic needs of Sasol employees. After Parys the next filling station was opened at Vanderbijlpark in the Transvaal fifteen kilometres away from the plant, followed by Johannesburg and Pretoria a year later. Since then the whole country now counts over a thousand Sasol filling stations (Collings, 2002).

Given the successes of the pilot plant the government did not hesitate to expand to successfully meet the oil embargo. This propelled the speedy construction of the Sasol TWO and Sasol THREE plants in Secunda in 1975 and 1978 respectively on much bigger scales. At this stage the only challenges that posed a threat to further expansion was, whether there would be enough workers to construct a structure ten times bigger than the pilot structure, to ensure proper budgeting and enough artisans to operate the plant. It was then that Black people were recruited and trained for various tasks in the plant in the 1980s. With the construction of Sasol TWO and THREE the company could meet a third of the country's fuel needs. The oil

embargo posed a major threat to the developing economy of the country whose economic drive largely depended on sufficient fuel supplies. The economic development of the country was clearly at stake. The two new oil production facilities became icons of the country to be defended by all means. Those who operated the plants not only served as chemists and engineers but also as soldiers when under threat (Lunsche, 2004).

Sasol has greatly developed since 1994. The company moved on from CTL productions to GTL exploration. The GTL process yielded cleaner more environmentally friendly fuels. This was an added bonus for Sasol. These developments were propelled and influenced by the pressure the country experienced from international concern over greenhouse gas (GHG) emissions. The natural gas employed by Sasol since 2004 is imported to Sasolburg from the natural gas rich reserves of Mozambique that are not utilised by the Mozambique government (Sasol Facts, 2007).

Sasol is the major contributor towards the Sasolburg Metsimaholo municipality. The company has a gross geographic product (GGP) contribution that ranges between 50% and 60%, estimated at a 4 R billion contribution towards the Metsimaholo municipality. The company has indirectly contributed towards the neighbouring towns of Vanderbijlpark and Vereeniging from which it draws its basic service providers. Some major service providers come from the Gauteng province as far away as Johannesburg. Sasol provides 198 391 direct and indirect job opportunities (Knowles and Pinter, 2001; Sasol Facts, 2008).

The company is the major source of income for the communities of Sasolburg, Vaalpark and Zamdela, although the unemployment rate around Sasolburg communities still stands at 65%. It also plays a significant role in road construction activities jointly with the local municipality as well as the town's electrical reticulation system. It has 31 800 direct job opportunities globally of which 5000 are in Sasolburg, 51 240 indirect job opportunities and 116 514 induced job opportunities. Sasol supplies fuel needs throughout the whole of Southern Africa countries by way of road and rail transport.

In 2006 the company had a direct input contribution of R 26 billion towards South Africa's revenues and an indirect input of R 146, 3 billion. The company makes proportionately large contributions towards the Free State and Mpumalanga provinces. Of its national contribution 11,5% and 16% gross value add (GVA) go towards the two provinces respectively (Sasol Facts, 2008; 31).

The company's annual revenue turnover is determined by the global crude oil price which is expressed in foreign and stronger currency, the American dollar rather than the less advantageous South African Rand. Sasol contributes significantly towards Black Economic Empowerment (BEE) in the country. These include Igoda Coal Export mining, Ixia Coal, Tshwarisano investment, Exel fuels and Inzalo equity initiatives. It also contributes towards some of the country's Small, Medium and Micro Enterprises (SMME) especially those that sell paraffin in their local areas (Magubane, 2008).

Since the lifting of sanctions Sasol is making a huge impact in the global energy fraternity by marketing its CTL and GTL processes. The company is continuously signing deals with various countries thus profiting from their distribution of the CTL and GTL processes. The deals involve rights to the F-T technique which the company mastered during the period of the oil embargo (Leonard, 2006). Sasol has helped to alleviate fears about the dwindling crude oil resources. Sasol's jet-fuel was the first to receive full approval by various international rating bodies as the most environmentally friendly fuel. This occured after the country had been utilising this clean burning fuel for almost ten years (Janine, 2008). Currently international institutions have shown interest in exploring the F-T process even more fully (Fulton, 2003). Sasol is the only company in the world to register a nitrous oxide N2O greenhouse gas abating project. The project can reduce GHG emissions of up to 1 000 000 tons of carbon dioxide per year with a great potential for carbon credits (Groh, 2007). This achievement has been confirmed by Heatwatch environmental activists.

Coal has been the major feedstock item for the company. Sasol introduced efficient coal mining equipment and strategies in the coal mining industry such as the in-seam horizontal drilling of coal, which replaced pick-axe coal mining. Electric lights were introduced to replace the tiny hard-hat mounted lights. The transportation of coal on rail-hoppers was replaced by pneumatic shuttle cars with tyres. The hauling of coal with ropes was replaced by conveyor belt

transportation. Rock blasting and pick-axe utilization were replaced by a continuous miner. Timber roof supports were replaced with steel bolts. Gasifiers that were hand operated are now computer operated by controllers. The manual removals of ashes were replaced with remotely controlled computer technology in control rooms. These also brought about huge downsizing of workers in their wake (Collings, 2002). Sasol has major economic operations going on in developed countries such as the United States of America, the United Kingdom, Germany, Japan, Saudi Arabia and India (Sasol Facts, 2005).

The company invests heavily in education and training, capacity building, arts and culture and environmental matters. With regard to education the company helps to build science laboratories, libraries, computer laboratories and the purchases of books. It works closely with nature conservationists and environmental groups and runs seven game reserves near Sasolburg. The company supports national sporting activities such as the National rugby team. It has been the sole sponsor of the 2008 South African Paralympics team in Beijing and the national radio news coverage of the Paralympics games activities (Sasol Facts 2008).

The construction of the plant was initially meant to attract the white population of the country. Increasing demands in the construction of the plant, attracted the influx of Black people into the area from around the country as well as from neighbouring countries and scientific experts from overseas. The first area to be inhabited was Protem which has now become part of Zamdela, a

Black residential area south east of the plant. The town Sasolburg is named after the plant. The town received its town status recognition in 1967. Due to the potential impacts of the plant's operation, more than 70 000 trees were planted in Sasolburg to mitigate atmospheric emissions from the plant and other volatile emissions in the region.

As a chemical centre in the country Sasolburg's atmospheric condition attracted the attention of various environmental activists of both local and international origin. There have been complaints of poor health conditions such as various chest ailments, respiratory diseases, eye irritations, skin rashes and cancers (Ground Work, 2003). Sasolburg was established when the country was at the peak of its political segregation turmoil. The constitution of South Africa promotes human welfare and the right for all to a healthy environment. These rights were previously neglected by the Nationalist Party government. This is generally evident in most Black community residential locations in South Africa. The Black residential areas were often placed downwind and downstream of polluting industries and very close to waste disposal zones, totally separated from white community areas. Zamdela was one such creations (Hallowes and Butler 2003: 9).

It has been established that atmospheric gas readings from Sasol's Steam Station TWO monitoring system in Sasolburg at times exceeded the amounts recommended in the WHO/EC guidelines (Groundwork, 2003). It is expected that Sasolburg's atmospheric conditions would be drastically decreased by 2009 when the full GTL operation will be given force. Comparatively speaking

of the three Sasolburg communities Zamdela is the hardest hit by the impacts of atmospheric pollutions. It has no monitoring station while the other Sasolburg communities run five monitoring stations. Zamdela is situated downwind from the plant. There is a street that separates the township from the plant. Mostly the wind direction, being North Westerly, blows straight towards Zamdela (DEAT, 2006).

The full conversion from CTL to GTL of the Sasol plant by 2009 promises greater improvement in the atmospheric conditions of the town. The main purpose behind the CTL to GTL plant alterations is to mitigate these pollution levels to significantly reduced amounts in light of global warming stipulations. The full GTL operation promises improved emission capacities of Sasol facilities for the Sasolburg area. The new process has inherent pros but also cons. The GTL introduction involves retrenchments to avoid employment redundancies. As gas is channelled from Mozambique through pipes to Sasolburg it reduces the need for coal production greatly. This will put into effect the downsizing of the workforce. Industrial downsizing has the potential to increase the risk of accidents and hazardous substance release, and may compromise the health and the safety of workers and their neighbouring communities (View, 2002).

High salinity content and level of europhication have been detected in the Vaal River water and in the underground water resources of the Vaal Triangle. This has been an issue of concern (Braune and Rogers, 1987). It has been linked to industrial water waste and has been an issue of concern. Leaks from

the underground storage fuel storages, leak into the underground natural water resources. The dumping of company waste with poisonous substances needs careful attention and should cease. According to the NEAF (2006) report, waste is regarded as one of the poverty alleviating measures in South Africa. The poor often rummage through dumping sites for scrap metals and bottles to sell to recyclers for subsistence.

In attempts to live up to Sasol's mission statement the company responds to every rising concern with mitigating measures. At Steam Station TWO, Sasol conducts atmospheric monitoring that monitors atmospheric impacts as mentioned earlier. In mitigation the company has plans to implement a 30m long octagonal tower in April 2009 at Sasolburg, a technology called Totally Enclosed Ground Flare (TEGF) the first of its kind in the country. It is believed that this mechanism will serve to ameliorate environmental impacts of concern such as noise pollution from the plant, low frequency vibration, smoke pollution and flaring illumination through a complete combustion technique. It is believed that this technology will help to solve environmental problems at ground level (Swanepoel, 2008).

Environmental activists (EAs) from Los Angels have supplied Sasolburg communities with "Bucket Brigade" devices to do self monitoring of atmospheric gas pollution impacts for improved social environmental conditions. This device has confirmed the findings detected by the Sasol Steam Station Two monitoring device. The "Bucket Brigade" device was used in the year 2000, and picked up elements of emissions from the Sasolburg

communities' atmospheric gaseous state such as toluene, benzene, acetone, carbon tetrachloride, tricholorethene, ethylbenzene, styrene, carbondisulphide, methylene chloride, dichloroethane, tetrachloroethane, mixed xylenes, silicic acid tetramethyl ester and hydrogen sulphide. These chemicals are believed to have detrimental effects on human health and some are capable of causing cancers. A possible link between the hospitalisation of some people in Sasolburg and the impacts of the atmospheric gases has been established (Knowles and Pinter, 2001).

A Strategic Environmental Assessment of the Vaal Triangle was carried out and sponsored by Sasol. The company started an initiative for community awareness called Community Awareness and Emergency Response (CAER) with roots in South Durban. It endeavours to form good neighbourly agreements whereby Sasol has to ensure operational transparency and information accessibility, establish a community industry organisation, promote independent studies for alternative developments, inspection agreements, corporate investment, disclosure of capital investments and commitment, retraining in advance of technological changes, community reparations, funds for studies, industrial agreements enforcement, union organisation, annual safety audit, stopping unsafe work and trade secrecy (Peek, 2000).

Sasol has come a long way to get to the world renowned position it holds today against all odds and challenges. It has proved to be a benchmarking and leading pace setter in the petrochemical industry world. In South Africa it

is a social giant of pride. Environmental health as a right is an entitlement that forms a basic human right for all. Workplace emissions violate that right. The local community is the pool from which the workplace draws its workforce. In essence this constitutes the link between the workplace and its immediate community. This study reveals that there are social and domestic factors that can pose a safety threat at the workplace which requires vigilance from the company and its workers. The company upholds safety and health at the workplace as very important. If the external impacts of the plant are not taken care of, they may bring about undesired repercussions for the company. It would mean that the company does not ensure total but only the partial safety and health of its workers and that environmental injustice is exercised over the community and workers by the company. The company holds safety in high esteem at the workplace, and in a short time achieved much in its safety and health administration history. The next chapter deals in greater detail with the company's achievements to date in ensuring safety and health at Sasol.

CHAPTER THREE

The Context of the Study

This chapter pays special attention to the subject of occupational safety and health administration (OSHA) as applied at Sasol Infrachem. It opens with workplace safety as a recent ethical dimension of concern in the business world. It begins with a review of the origins of occupational health and safety administration series (OHSAS) 18001 and its developments. It continues with a brief historical development of Sasol Safety, Health and Environment (SHE), the nature of a petrochemical industry's risks and, finally, the OSHA measures of Sasol pertaining to the South African occupational health and safety Act No. 85 of 1993 and other safety related measures that are applied by Sasol for improved safety and health administration in the company. The attractiveness of an enterprise's investment is not only determined by its economic productivity but also by its organizational level of environmental use, protection and security (Arkadov, Evanov and Serov, 2006).

There is a new trend originating in the U.S. that pays special attention to corporate integrity. According to Adobor (2006), scandalous unethical business activities receive wide publication in the U.S. Corporate misconduct stigmatises and impacts negatively on the reputation of an organization. Corporate misconduct can be costly in terms economic success and failure depending on the integrity of the establishment. Now organizations are under

pressure to reveal their program foci in managing workplace ethics (Adobor, 2006).

Issues of human wellbeing have developed to advanced levels due to Environmental Justice activists' perspectives and ILO interventions relating to workplace safety and health requirements. Corporate compliance programs should not simply be reflected in black and white documentation but should be designed and implemented in an effective and credible manner. Hence corporate managers are held accountable for inculcating an understanding among employees and for ethics compliance into a culture, a way of life in the workplace environment (Canary and Jennings, 2007).

This demands business leaders of high ethical repute. Business leadership plays a significant role in the moral capability and performance of an organization. Business leaders of high integrity are more likely to be aware of and respond rapidly to stakeholders' moral concerns (Petric and Quinn 2001). For more than a century in global industrial development, there was a lack of common universal standard's to govern workplace health and safety (Smith, 1999). The discipline of health and safety in the workplace started to develop from the 1970s with the establishment of the Occupational Safety and Health Administration body in the United States of America. This led to the establishment of the US Occupational safety and health Act of 1971. There was generally a need for a specific health and safety management system to be internationally recognised and certified. Danna and Griffin (1999) state that there was an enormous, disjointed and unfocused literature in various

fields that was more or less directly related to the subject of health and well-being in the workplace. Industries are faced with growing global market competition. This sparked interest in a globally accepted standard, to bring about improvements and transformations in their processes for global profitability (Oliveira and Almeida, 2008). The British Standards Institution came up with the British Standard BS 8800 that served as a guide to the British Occupational Health and Safety Management System. In 1998 Britain in conjunction with other national standards bodies, Consultant Specialists and certification bodies from other countries, amongst them was the South African Bureau of Standards, met to discuss the matter. This gathering came up with an occupational health and safety specification series known as the occupational health and safety assessment series (OHSAS) 18001, which was introduced and took effect in 1999 (Smith, 1999). Initially it was not a standard but a safety management specification that was structured to run parallel to and be compatible with ISO 9001 and ISO 14001. This left a loophole that caused hassles in its implementation by other organisations (Wang, 2007). This safety management tool was recently modified and released in July 2007 when it was adopted as a standard. It is relatively speaking a new standard (EORM, 2008).

It is believed that unlike its earlier version, this version demands more worker participation and consultation in harmony with ILO demands. It successfully helps to incorporate the basic view-points of current theories and methods, and provides a friendlier interface with management practices. It is stated that recent modifications to OHSAS18001 are with regard to clause 4.3.1 on

hazard identification, risk assessment and in determining controls. It puts more emphasis on the consideration of human behaviour, organizational changes, legal requirements and processes when conducting hazard identification and risk assessment (Wang, 2007).

Section 4 of OHSAS 18001 requires that organizations should provide an occupational health and safety policy that reflects the company's shared vision, commitment, direction and intentions. It requires an organizational plan that identifies hazards, assesses risks; shows implementation and maintenance control; and outlines risk addressing strategies; it has to reflect a compliance statement with regard to legal obligations and other requirements. With regard to implementation and operation, organisations need to reveal well defined responsibilities, adequate commitment of resourses by qualified experts, up to date documents and data and ensure control measures and adequate emergency preparedness. It demands an on-going management review for continual improvement through a regular review of audits, corrective actions, legislation and other critical information (LMCS, 2007)

In South Africa the contents of OHSAS 18001 is reiterated in the context of the Occupational Health and Safety Act as a workplace regulation in the country. It is (Act No. 85 of 1993) "To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of the plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory

council for occupational health and safety; and to provide for matters connected therewith" (LexisNexis, 2006; 5). The Act highlights roles to be played by both the employers and employees with regard to workplace safety and health compliance.

The benefits that are derived from complying with the OHSAS 18001 regulation have proved to be very attractive to progressive organizations all over the World (O' Connel, 2004). The standard helps to form an all embracing protective measure for the safety of the workers and makes provision for the evaluation of the success of its implementation. It facilitates a positive attitude towards audits at every implementation level, and gives guidance to the process of continual improvement. The standard helps to minimise delays and disruption of production due to incidents. It helps organizations to adopt a proactive rather than a reactive approach to safety management that is cost effective in the long term in preventing lawsuits and and compensations pay-out. Establishments that tend to prioritise profit before safety, often perceive prevention as not economically feasible, inconvenient, troublesome and unrealistic. They prefer easily identified costs to non-tangible and difficult- to- observe benefits (Zwetsloot, 2003). The Standard helps to improve organizational workforce relationships and guarantees quality of service that is attractive to customers and helps to withstand international competition. It highlights hidden strengths and weaknesses and room for improvements and discloses an ethical stance of the organisation in giving priority to health and safety (O'Connel, 2004).

The act requires of the employees that they must take care of the safety and health of themselves and of other persons as follows: Workers should always observe the employer's stipulations that need to be performed and complied with. They ought to carry out all given lawful orders and follow given procedures. A worker should report any unsafe or unhealthy situation that comes to his/her attention as soon as possible and report every incident that may affect his/her health, or cause him/her harm, as soon as possible.

After Sasol joined the international World market and became signatory to Responsible Care in 1994, the company developed its interest in pursuing pursue safety and health in conducting its business. Concern for safety and health in the workplace at Sasol was raised to a higher level in 1996. The company was not happy with the standard of occupational health in its operations then. The standard could not address the needs of the business environment. After a long unsuccessful search for a feasible commercial system, the company decided to develop its own system (Labuschagne, 2003). The subject of safety and health in the workplace started to gain momentum in the mid 1990s (Brown, 1995). It is a current trend in the business World to look for systematic ways to transform organisational operations in favour of competitive market forces. In the process, safety and occupational health has become an integral component of management plans as a necessary dimension in conducting sound business (Oliveira and Almeida, 2008).

In 1999 Sasol established its Sasol Health and Environment centre (SHE), the company became a signatory to the United Nations Global Compact on human rights in 2001. In 2002 it took part in the World Summit for Sustainable development and launched its HIV/Aids response programme in 2003. In 2006 Sasol operations saw the introduction of minimum requirements for SH&E, and in 2008 the company achieved the full OHSAS 18001certification for its occupational safety and health management system at its Sasolburg and Secunda operations (Sasol Facts, 2008).

Safety at a petrochemical establishment must be of prime concern due to the risks that go with the nature of the plant and its operations. As part of the company's legal compliance exercise, Sasol identified categories of potential risks in its operations. For the workplace, only concepts of interest to the subject of this study have been selected. The risks of concern here include major fires, explosions and releases of hazardous gases. The risks that are related to logistic undertakings include explosions, emissions, spillages and gas ruptures. The potential health impacting risks include long-term exposure to harmful chemicals. The technologically related risks include R&D concepts, design, construction and commissioning and the lack of skills and competence to design, operate and maintain plants (Sasol and Sustainable Development, 2008)

The causes of petrochemical plant incidents are various processes such as corrosion, wear, deformation, swelling and fracturing of plant equipment. In order to safe-guard against these conditions, the company requires the

conduct of regular maintenance checks of plant equipment by various methods. The methods involve processes such as ultra-sonic thickness gauging, capillary detection, and magnetic powder testing and heat exchange tubes. These are preventive methods that help ensure a continuously safe operation (Klyuev and Rosnin, 2004).

In its endeavour to comply with the legal requirements of the country the company has structured its occupational safety and health policy in a sequence that follows patterns similar to the OHSA of the country. Among its ultimate objectives is the aim to inculcating in the workers a clear understanding of the general safety and health rules of Sasol by participation, and ability to demonstrate a lucid understanding of the safety and health rules. Sasol wants the workers to be able to competently identify the safety signs of the company, and to demonstrate the correct desired safety response in times of emergency (Sasol Induction Policy).

Entrenched within the vision the company, Sasol espouses to be respected, to apply innovative and competent technologies and to excel in marketing, energy, fuels and other sectors. In its policy the company recognise the impacts of its operations on people and the environment. This has caused the company to take into consideration SHE issues as major components in planning. The company adopts an ethical stance to bring about a balance between economic, social and environmental needs in its operations. Pat Davies, the company chief executive, views ethics as knowing what the right thing to do is and having the courage to do it (Sasol Investors Report, 2008)

Sasol articulates its commitment to caring for people and the environment and to be responsible when utilizing natural resources. The company articulates commitment to continuous improvement to its SHE performance. It expresses its commitment to comply with all legal requirements of the country and other agreed requirements and to engage in consistent dialogue with stakeholders on safety health and environmental issues. The chief executive of Sasol, Pat Davies holds that a company of Sasol's size will continue to be under critical public scrutiny, hence it is necessary to be open and transparent when reporting of the company's sustainable performance and to respond to issues of concern and interest to stakeholders in order to maintain and secure their trust (Sasol 2006).

To achieve its objectives the company policy claims to implement internationally recognised SHE factors in its integrated management systems and to implement safer and cleaner technologies. Sasol chose to adopt a cradle to grave approach in dealing with its products from their manufacturing up to their disposal by the end user for environmental safety purposes. It promotes and recognises the right to know by informing and training all its employees and contractors on SHE matters. Sasol puts a high value on effective response to SHE emergencies. It vows to participate with authorities and institutions in the formulation of legislation, standards and their implementation in workplace conditions. Sasol promotes benchmarking on best SHE practises throughout its operations and shares SHE risk reduction strategies and best practices throughout all Sasol facilities.

The OHSA No.85 of 1993 of South Africa focuses on workplace environment safety and health matters. Sasol claims to go above and beyond these legal dictates in pursuing SHE matters in its operations. The company pursues a Responsible Care approach towards safety and health in general. The scope of Responsible Care safety and health coverage goes beyond the workplace parameters. It encompasses ISO 9001 factors on quality, ISO 14001 factors of environment as additional to the safety and health ISO 18001standard. It further engages process safety management factors, behaviour based safety, Sharp an HIV/Aids intervention programme, T.B., Life saving behaviour, Star, SSPs and Codes. Responsible Care is an international voluntary standard that is adopted by and governs chemical industries in safety and health related matters. Its approach involves cautious engaging with SHE matters for minimal impacts; responding to community concerns; reporting promptly to authorities; giving relevant advice to customers on products; co-operating with governments and legislations and promoting the sharing of Responsible Care principles and products.

There is a Sasol safety programme that is conducted at factory entry to first time employees known as the safety induction. This is followed by specific plant safety induction. At the beginning of every work shift the workers are involved in a safety talk briefing. This is where all daily safety experiences and incidents are shared, including near misses. This is one of the strategies the company engages to inculcate to workers a safety culture in workers. These safety talks are not restricted to the latest workplace incidents only, since

social and domestic cases are also discussed. Every two years the workers go through the safety induction along with new employees. The safety induction programme is conducted every week, almost on every second anniversary of employees in their employment. This helps to cater for different groups according to their arrival at the company. This precludes having to deal with all workers in one session.

Life saving behaviour is prioritised in the programme. This includes vehicle and road safety. The speed limit within the company is forty kilometres per hour. Drivers must be in possession of a valid driving licence and ensure that vehicles are roadworthy. Pedestrians and trucks have the right of way within the premises and buckling up is emphasised; non-compliance attracts punitive measures ranging from warnings, forfeiting safety performance bonuses to expulsion. The company strictly adheres to the rule of no work permit no maintenance by workers. This helps restrict workers from carrying out unsafe work prior to inspection and safety assessment and protects them from unexpected incidents. Sasol observes the use of quality instruments at all times and forbids the workers from using defective tools when doing their duties. This goes as far as confiscation of defective tools from anyone, including service providers. Cellular phones are not allowed in production areas. The company does not allow workers to use flammable cleaning material when cleaning or to use plant compressed air to blow dust off their clothes as a safety precaution.

Entering confined spaces without a permit is not allowed. A work permit is required so that a standby can be provided for any emergency that may arise. Sasol strongly believes that incidents can be avoided and accidents minimised. There are regulations pertaining to lifting objects, be it with a forklift or physically. There are regulations and personal protective equipment (PPE) for working at heights. Various strategies to deal with emergencies are taught such as proper and effective ways to deal with fires especially minor fires. For major fires a reporting system is provided to ensure a speedy response by fire experts of the company. A tele-intercom system is available throughout the plant to ensure speedy reporting of emergencies. Workers are expected to report injuries, fires, incidents, including near misses, explosives, gas leaks and spillages as signs of emergency. Ground disturbances are viewed with utmost vigilance in the company. There are specific procedures to follow in dealing with spillages and roles to be played by workers such as isolating the area for safety reasons.

Sasol supports and complies with the South African constitution on human rights to health and espouses the UN global compact on human rights in its policy. The company endorses prevention and compensation for human life. Sasol has the resources to enhance life and human rights and to inspire a culture of caution in the workplace. As signatory to the UN global compact the company has to observe the principle of the global compact that businesses should support and respect the protection of internationally proclaimed human rights and ensure that they are not complicit in human rights abuses. The global compact upholds the freedom of association of workers and the

effective recognition of the right to collective bargaining. It preserves elimination of all forms of forced and compulsory labour, the abolition of child labour and the elimination of discrimination in respect of employment and occupation (UNGC, 2008).

Sasol, in line with the OHSA regulation of the country, has specified the role to be played by the company in policy, appointments, identification of hazards, the SHE plan, provisioning of PPE, managing and controlling as well as enforcing workplace regulations. The company has also laid out the role that has to be played by the workers with regard to Occupational Health and Safety requirements. The workers are expected to take care through the "three whats" safety clause of what can go wrong what can cause it to go wrong and what can one do to prevent it from going wrong. This clause encourages vigilance from the workers, as the constitution states that one has the right to refuse to carry out unsafe work. The workers are encouraged to always be observant, to report hazards and signs of emergency as soon as possible. They are expected to attend training, carry out lawful acts and to comply with the act.

The company has put in place a safety sign system to caution workers at all times within the premises of the company. The signs are categorised into warning signs, information signs, location sites (for fire extinguishers and masks), compulsory required safety PPE at various sites as well as pipe content and its flow direction. The workers are expected to observe these at various sites as indicated by the signs. The workers are expected to wear

proper PPE; some sections strictly require chemical resistant PPE. Loose clothing and shorts are not allowed in production areas. Workers are warned against wearing jewellery; whoever does, wears it at his or her risk. This is due to risks that go with jewellery related incidents.

As a safety measure, good housekeeping is to be practised by workers. Everyone, at the end of every work shift, is expected to tidy up his/her workstation and the area at which he/she was working. The prime rule with house keeping is ‘every tool at its right place and a right place for every tool’. Safe storage is a priority. Refuse demands extra-care at some workshops. There is iron/steel refuse, wooden refuse, cloths, bottles all separately marked according to category for various destinations and for the safety of refuse collectors.

For the personal health of the workers, measures have been put in place by the company to cater for various worker health needs like injury dressing, medicinal supplies for ailments such as headaches, on site clinics and call centres for traumatic and psychological interventions and first aid-kits. The safety induction programme informs the workers of the importance of personal health and hygiene. Among others it deals with how T.B. is contracted by an individual and the related symptoms of having contracted it are explained. The impacts of T.B. in society as an opportunistic virus attacking HIV/Aids infected individuals are explained. The safety induction programme also deals with HIV/Aids awareness and highlights the importance of knowing one’s status. It

is a good and well detailed presentation stressing the importance of the defence safe guarding of one's assets (Sasol Induction Material).

The safety rules at the company are designed to protect the workers and apply to every Sasol worker, therefore all Sasol workers are expected to observe these rules and to comply with them consistently. Sasol considers safety and health as a top priority in its ongoing activities. The company has benchmarked, as its long term safety goal, "Zero exposure to harm". It has put in place a recordable case rate (RCR) a safety performance monitoring system that helps track the frequency of incidents at the workplace. The company has put in place a safety attitude and behaviours rewarding system to encourage a safety culture. Sasol claims to lead by example and discourages malpractices through constructive intolerance. The company demands the same level of competence and compliance from service providers. The company holds that all Sasol workers are individually and collectively accountable for the safety of themselves and those around them. Sasol's OSHA measures involve a lot more than the ones mentioned in this thesis work. These alone have been highlighted for purposes consonant with the objectives of this study.

As crude oil has reached its zenith and industries continue to develop to meet the UN requirements for cleaner developments, well established cleaner Sasol fuels are favoured and are increasingly in demand. More operations to produce Sasol fuels are being established in various countries of the World. In every business establishment human beings are involved. In the current era

investing in social responsibility has become a core component of conducting business (Begley, 2006). Human life continues to gain value and global communities continue to become more aware of human rights. Research has proved that the subject of safety in the workplace has become a popular theme that has begun to dominate in science since the beginning of the 21st century. Dealing with human beings demands an ethical attitude in conduct of business. This implies that business and environmental justice increasingly go hand in hand for the welfare of human life through the influence of OHSAS 18001 in competing world markets. The introduction of a common OSHA standard facilitates compliance with the regulation and makes compliance an obligation in order to compete with other businesses in the Global market. The world economic interests differ from socialist states, semi-socialist and capitalist states. A common regulatory standard has to be maintained to ensure a smooth operation amongst the states for a common cause of human wellbeing. Making safety a priority at Sasol in conducting their business has brought about profitable results for the company in a relatively short space of time. The introduction of a common OSHA standard facilitates compliance with the regulation and makes compliance an obligation in order to compete with other businesses in the global market. A common regulatory standard helps to maintain smooth cooperation among states for the common cause of human wellbeing. The OHSAS 18001 safety and health standard has proved to be an effective standard that continues to gain popularity in well established businesses all over the world. It helps bring about dramatic changes in many companies whose practices are now geared towards zero tolerance of health and safety hazards in conducting their business (Zwetsloot, 2003).

CHAPTER FOUR

A Presentation of the Findings

Introduction

This chapter contains the findings of the study that has been conducted at Sasol Infrachem in Sasolburg. These are both reported and graphically tabulated as Sasol Infrachem findings in Sasolburg. They are presented and categorized according to the objectives of the study in relation to the number of the interviewed respondents. The tape recorded one on one interviews were systematically drafted for every individual respondent, in order to view the responses in light of the company's objectives and expectations from the workers. The findings are the results gathered through a questionnaire that was based on the Sasol safety induction content discussed in the previous chapter, Chapter Three. These are followed by a succinct conclusion to the chapter.

The Responses of the Workers

The responses have been indicated as high (H), partial (P) or low (L) towards the company's expectations and desired reflections from the workers. Sasol has as an ultimate objective the full understanding of OSHA measures by the workers. The questionnaire consisted of several questions probing for variously examining how the respondents relate to and maintain the OSHA measures of the company.

The study reveals that the workers' responses vary. The H group represents those respondents that show a distinct mastery of the OSHA content that was tested for. The P responses consist of responses that show partial mastery of the OSHA measures of the company. The (L) responses reflect low mastery of the subject matter. It should be noted that it was not the intention of this study to do a comparative report of the Sasol Infrachem business units. This study reflects Sasol Infrachem responses as a whole unit.

The study did not find any significant relationship between worker perceptions and experience since the categorised groups (High, Partial and Low) reflected all ages and all work experience categories but subjective responses were expressed (featured in Chapter Four). The study did not show any relationship between education level and worker perception.

Most candidates had matriculated while a few had (grade 6-10) One respondant had grade three only. Another interviewee had no formal schooling even though he had thirty
years of service with the company and no other. This person revealed distinctive mastery of OSHA measures of Sasol with a serious concern for a portable radio for safety related reasons. It was clear that younger respondents felt intimidated by the older ones who find it hard to take instructions from the youth. Some of the senior workers thought those who come fresh from technical universities acted as "know - alls". Other respondents thought those fresh from universities to be curious, and always

keen to experiment since they were exposed to a lot of theory and posed a risk of endangering themselves and other fellow workers. However, there was a relationship between safety perception and gender though not exclusively so. Female respondents tended to reveal partial to lower mastery of OSHA measures at Sasol. There were language challenges for non English speaking (as a home language) individuals.

The Worker's Level of Understanding

Of the 61 interviewed respondents, thirty five (57%) revealed a high (H) level of understanding of the OSHA measures of the company. Fifteen respondents (25%) disclosed partial (P) understanding of the OSHA measures of the company, while eleven interviewees (11%) exposed a low understanding (L). Some of these could not interpret the signs, others had no idea of a defective tool and yet others had no idea of non-flammable cleaning material. During the safety induction the company stressed that workers should not make use of flammable materials when cleaning. By implication workers are expected to reveal knowledge of what flammable materials are so as to be able to avoid them and to vigilantly guard against their use in order to report such acts and warn those who might wittingly or unwittingly be using these hazardous flammable materials. The question asked what non-flammable material should workers use when cleaning. The rationale behind the question was to establish the workers' level of understanding of flammable and non-flammable materials without which the workers cannot effectively comply with the regulation.

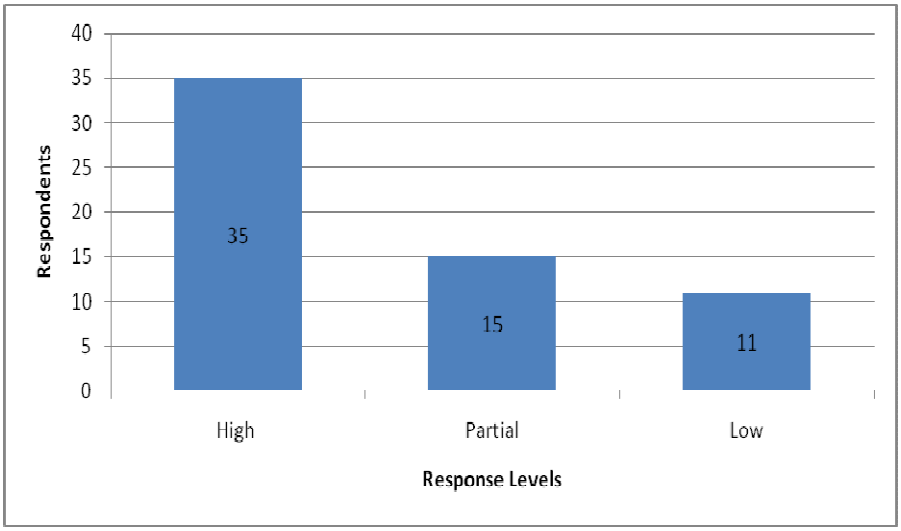


Fig.2 Workers' levels of understanding OSHA plans

Five respondents stated that they had no idea of flammable materials. Four respondents provided partially correct responses stating that it might be water but that cleaning was not part of their duty. One respondent, like many others, mentioned clean water, dish washing soap and other domestic detergents but added that acetone is flammable but it can be used. Another respondent stated that it depended on the type of cleaning that has to be carried since some conditions require cleaning with flammable material. Some respondents stated that they do utilize petrol, benzene, spirits and thinners at home and that this was not allowed at the workplace it is not allowed. One respondent stated that as cleaning was not among her duties, the question was not applicable to her. Others mentioned that private contractors do the cleaning at their sites, while yet others mentioned plastic and rubber as non-flammable material. One respondent mentioned a broom as non-flammable material that can be used.

Sasol expects the workers to show competence in reading the signs employed in the workplace. Twelve workers were not sure of some of the workplace signs that were shown; some could only interpret one or two of the given signs. One respondent gave responses that were not plant related such as red stands for danger, blue for peace and for go and even so stated that she wasn't sure of the signs. Others stated that they know signs other than the ones that were given. Thirty five respondents showed proficiency in interpreting the given signs. When the workers were asked if they knew when a tool was defective two candidates said that they don't make use of tools at their sites. Three stated that they don't have tools but know that defective tools have a great potential to harm. The workers clearly understood good house keeping very well. They also displayed a good knowledge of how to respond when the alarm goes and knew the correct procedure to follow in case of emergencies such as gas leaks or even fires at the workplace. Here most responses revealed a high (H) level of understanding of the company's OSHA measures.

Of the 61 respondents 35(57%) reflected unequivocal overall understanding of the company's safety stipulations. As reflected in the graph 15 respondents (25%) revealed partial (P) understanding of the company's OSHA policies. These were the Sasol employees who could not demonstrate a full understanding of the safety signs of the company, employees whose responses were not specific, and those who could not say what a defective tool is, however, they display a good understanding of how to respond in cases of emergency, and knew good housekeeping.

The Worker's Levels of Vigilance

With regard to vigilance a high percentage of the respondents displayed a high capacity for vigilance in the workplace. More than three fourths of the respondents (82%), revealed a strong and outstanding ability to be alert in the workplace. Eight percent revealed only partial vigilance while 10% revealed a low capacity for vigilance. In this category the P group consists of those respondents who when asked what flammable materials they should avoid when cleaning, responded that, it depends on what has to be cleaned, arguing for instance that a boiler needs special flammable chemicals to clean. It also includes those who said that they unavoidably do work with hazardous substances like MSDs but simply needed to be careful with measurements and use smaller quantities when working with acids.

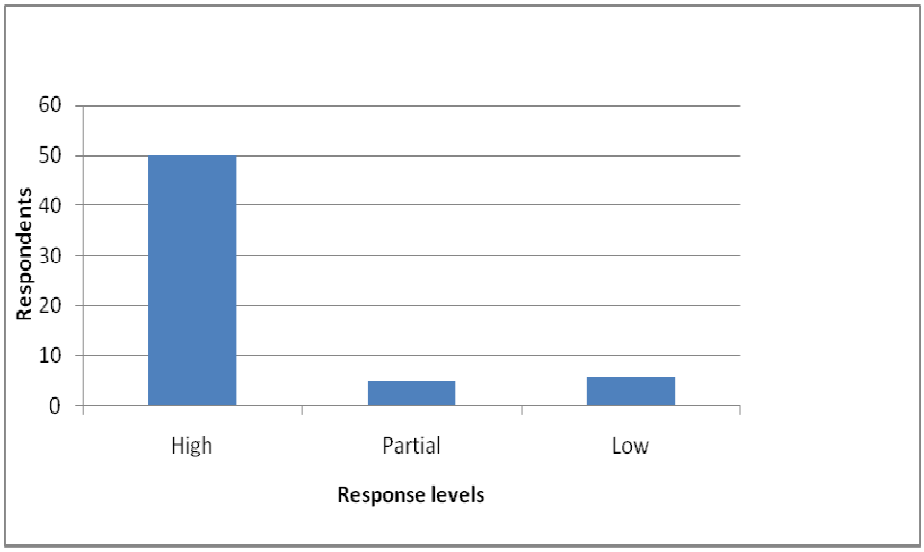


Figure 3. Workers' vigilance towards their safety and Health at work

One respondent mentioned that at certain times one has to quickly make use of one's discretion, arguing that when one observes a beginning gas leak, it is

wise to act quickly and operate on the equipment to stop a disastrous event from occurring even without a work permit and only then to report the incident, after maintenance.

Sasol trains all workers to remain vigilant at work at all times. The best practice the company has inculcated in workers is to do self inspection and risk assessment of the work site conditions using the catchphrase of the three whats. The company expects the workers to always check what can go wrong? What can cause it to go wrong? What can the worker do to stop it from going wrong? (The three whats). It is a procedure at Sasol that nobody can do any maintenance or task without an authorizing work or maintenance permit. One of the reasons for requesting the work permit is that it gives assurance that preliminary risk assessment inspection has been carried out and that possible risks have been ameliorated. It also notifies and alerts one of possible hazards to guard against what may happen at the site and it informs one of the necessary PPE to wear at the site. It is procedure at Sasol that workers should not carry out any duty that he/she finds to be unsafe and that has a potential to do harm. The workers are expected to report all such conditions before performing any task.

When asked what unsafe conditions or signs of emergency they should always guard against, many referred to slippery floors, insufficient lighting, workers not wearing PPE, unsafe acts, ignoring the three point contacts (looking, holding and stepping when climbing stairways), enough ventilation, hazardous substances, corrosive substances, reactive substances, unsafe

equipment, spillages, fires, ignition processes when starting a pump, not observing signage, falling equipment, use of cell phones on top of tankers as well as cigarette lighters, bumping against corners, suspicious conditions that can cause harm, barricaded areas, good housekeeping, damages, loose lying objects, specific walk-ways, smoking in forbidden areas, hazardous chemicals in bottles, faulty stairways, tripping hazards, unsafe excavations, defective tools and working without permit. Enough to highlight the realistic nature of the question for this context. One respondent stated that one must make use of one's senses, seeing, hearing and smelling. These can help detect suspicious unsafe conditions. Another respondent said of acting vigilantly that he guards against disturbing remarks from seniors. An unfocussed attitude at the workplace is a risk for him and others at the workplace. Of the L group respondents, two workers stated that they had no idea whatsoever of what conditions to guard against. Others said they are not sure of the emergency factors that are to be reported.

The company requires that workers should report all signs and conditions of emergency at all times as soon as possible. When asked what conditions or signs of emergency they should report, they mention one or two of the following unsafe acts, short cuts, near misses, environmental risks, deviations from the norm, defective tools, poor house keeping, expired fire extinguishers, gas leaks, fires, steam leaks, injuries, incidents, accidents, broken glasses, damaged equipment, low stock of product, unsafe conditions, slippery surfaces, things that are not in order, non compliances, danger possibilities, non hygienic acts, unsafe habits, loose cables, leaking pipes, rusted

frameworks, defective stairs, broken cable rags, foreign matters, defective tools, problematic situations, loud noises, paper cuts, collisions and people coming to work under influence. One respondent in the P group (8%) stated that there are no signs or conditions of emergency at his worksite since he works with computers. Obviously he had no clue of the hazards that are associated to working with computers. Two respondents claimed the question was not applicable for their site. One stated that it is only controllable conditions that need to be reported not uncontrollable ones like a hot pipe.

When asked the trick question as to what flammable material they should avoid when cleaning many respondents mentioned items such as petrol, diesel, paraffin, spirits, acetone, ethanol, methanol, re-acting chemicals, hydrochloric acid, products with a flammable sign, ethylene, cloths, quickly evaporating products, benzene, corrosives, thinners, phenol, solvents, turpentine, methane and oil. Of the L group some said they can't think of any, while two stated that they had no idea whatsoever of flammable material. Other respondents mentioned that cleaning was not applicable at their site. One respondent from the P group stated that it depends on the quantity of the flammable material that is used, while another mentioned that it depends on the nature of cleaning that needs to still be done, so one cannot entirely refrain from cleaning with flammable material. Yet another participant stated that acetone is flammable but very useful when cleaning an apparatus. He argued that if the right quantity of a measure is used, once an apparatus has been washed with clean water and soap and is then rinsed in acetone it will help speed up the drying process.

When asked if they could tell when they were physically fit and of what to do with a person appearing to be unfit at work most respondents said they would report the matter to their immediate supervisor (IS), send him/her to see a doctor or visit the medical station and/or give him/her a lighter duty for the day. As to giving one a lighter duty some said it's not allowed anymore but that it was a very good and much more helpful practice than the current one. They opined that of late every person has his/her own task which is not quite worker friendly. The workers did not mention the rationale behind the current practice. When asked who is responsible for ensuring safety at the workplace some from the L group stated that it is the safety representative or the safety manager's duty; others said it is the trained safety officer's responsibility while over 90% of the respondents said that it is their own responsibility, or everyone's duty or that the employer and employees both have roles to play.

The Workers Attitudes towards OSHA at Sasol

Responses to questions concerning attitudes revealed positive attitudes towards Sasol's OSHA strategies. A large number (87%) of respondents articulated absolutely positive responses while 13% of the respondents expressed negative (N) sentiments towards some of the questions in this section. When asked what they would do if they had caused a spill or come across a spillage at the workplace respondents stated that they follow spillage procedures such as containing the spill, which is to demarcate the area for safety reasons and to alert others of the area. If the spill is from a known substance being of a minimal or a controllable quantity they would clean it

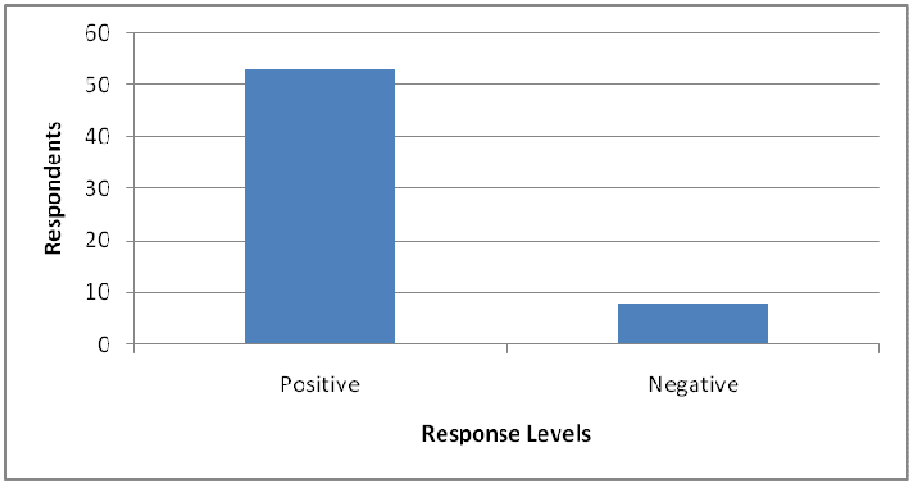


Figure 4. The workers' attitudes towards OSHA at Sasol

following taught procedures with either chemisorbs, saw dust or even sand and report the matter. If the spill were of a big quantity posing a threat to the environment they would contain the spill area and report it as soon as possible to the officials and call spillage experts so as to deal with the spill more proficiently. If the spill had affected the soil a reasonable amount of the affected soil area would be removed and replaced with appropriate typical soil. Others said that there were different procedures for different work sites to deal with spills.

The negative (N) responses comprised 13% of the respondents. The N group was made up of those individuals who when asked how interesting are the safety talk meetings, stated that these can be boring at times, one observing that the topics were not always relevant to her. Almost all workers when asked how helpful the safety talks were, 98% of the interviewees said that these were very helpful. Only one respondent mentioned that they don't have

safety talks in his part of the plant as he works on the outskirts of the plant. Of those who found some of the talks to be boring some still perceived these to be very important. Some stated that it depends on the presenter. The majority of the respondents found these to be very interesting and some said these talks involved everyone. Some said they were always interesting and eye opening. One respondent said they are very good, especially for new-comers.

When asked about the tool box or morning safety talks, some of the N group articulated confident and positive attitudes, only a few individuals expressed the sentiment that at times some of the presentations were tedious; despite this they hold these talks in high esteem as very important. A few glaring differences in attitudes emerged with regard questions about short cuts, PPE and work permit signing. Some workers find short cuts a horribly dangerous habit that can lead to deaths and damage to property, others see them as good though not allowed at the workplace, yet others find some of the short cuts harmless while others maintain that if one knows what one is doing short cuts can be good. Some respondents stated that short cuts will always be there due to differences in human nature and that at times short cuts happen unwittingly. One candidate stated that he was not sure about short cuts. Another mentioned that short cuts can be good but not always, at times they create hazards.

Others see short cuts as a wrong way of doing things while still others find them to be in conflict with working procedures. Some believe that short cuts embrace safety risks and agree that these are substitutes for workplace

procedures that compromise job quality. Several respondents perceive short cuts as wrong ways of doing things typified by a tendency to omit required steps. One claimed that there are no short cuts at their sites. A number of workers see short cuts as a major cause of workplace incidents that can lead to deaths. Others see them as involuntary actions that are readily executed, and at times unwittingly performed, such as climbing on a chair instead of fetching a step ladder to reach out for highly placed objects. Most workers believe that taking the long route such as looking for the step ladder and waiting for the work permit is always safer than short cuts.

The workers thought hurried work to be one form of taking a short cut. Others see short cuts as quick fixes that do not always work because even if one can get away with these at times at some stage they reveal themselves in terrible ways. With regard to PPE, plant workers seemed to value it more than do office workers. Three respondents expressed different opinions about it although they fully complied with it. One stated that PPE cannot always be effective and argued that once he had to remove his hard hat in order to work effectively at a spot cramped with pipes. Another respondent stated that surgical gloves cannot guarantee protection against glass cuts while the other stated that it cannot guarantee total protection, from a practical experience he was once burnt on the neck by a hot pipe while dressed in full PPE. One respondent stated that it is better to be injured while wearing PPE fully than without it. One respondent stated that she feels more comfortable and safe in her safety shoes both at the workplace and at home and doing house chores.

With regard to the signing of the work permit only a few individuals found it to be a waste of time. Instead the majority find it to be essential and in the interest of the workers. The workers see signing the attendance register as a black and white indicator of one's presence at the work site. Others see signing the work permit to be important because it informs one of potential dangers and helps track individuals in case of emergencies. Some said the work permit includes compliance strategies with regard to workers' safety. Others see it as a strategy that serves to highlight and specify the actual task that needs to be done that also helps to ensure that the assigned task has been completed. Others said that it is an authorizing document that confirms one's duty call.

Some believe that a work permit provides awareness of the job one has to do. Some say it is for the safety of the worker and plant equipment. Still others perceive it to be a binding legal declaration that one is aware of the potential dangers and agree that one knows what one is going to do. This can be held against one before a court of law. Others view it as assuring that a preliminary inspection has been carried out and that hazards have been mitigated, and that the site is safe to work on. Some view it as covering the worker in case of emergency showing that he/she has been legally granted authority to work at a specific site and that it gives procedures to follow without short cuts. Some mentioned that it was not applicable for their sites

How Workers Take Ownership of OSHA at Sasol

When asked about taking ownership of the OSHA measures, 90% of the workers displayed a high level of taking ownership of Sasol's OSHA

programs. Only 10% revealed P responses while no L group responses were given at all. The P group was made up of those individuals when asked who is responsible for the prevention of accidents in the workplace said that nobody could prevent accidents from happening but that an individual could simply make the place safer for himself/herself. Others stated that it is the safety officers' duty to prevent accidents at the workplace while 90% stated that it is everyone's duty to help prevent accidents and incidents from happening at the workplaces.

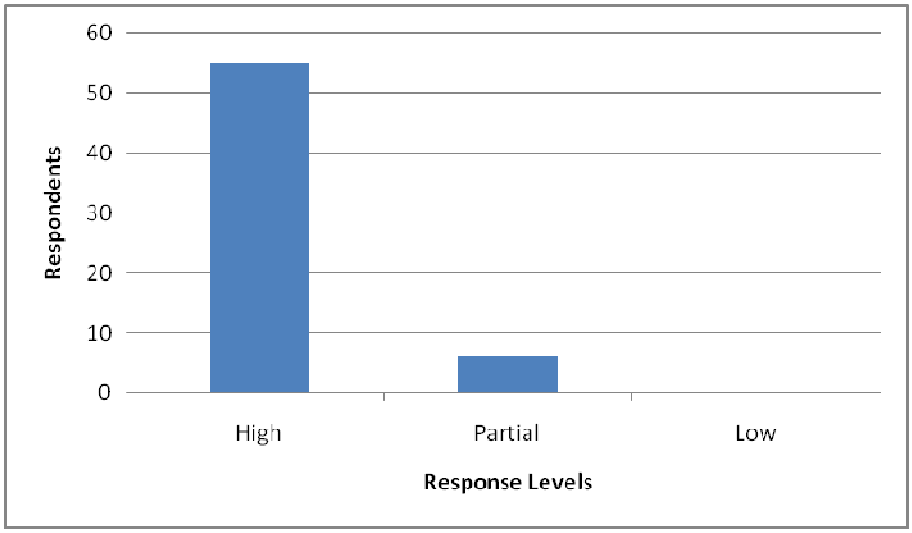


Figure 5. Taking ownership of OSHA by the workers

In response to the question as to what they do with refuse when proper refuse bins are not in place some stated that bins are always present at their site or that the question was not applicable to them since they make use of one bin for all types of refuse. Some workers said they can't leave it just anywhere; they carry it to the right bin. Others said they report it to the officials. Yet others said they make a request for the correct bin. Some said they organize

one quickly and mark it clearly. Others stated that they are always there and get regularly collected.

Asked whether they would rather receive than give advice at the workplace one respondent said he would rather receive advice; another said she would rather give advice and yet another respondent stated that people can be nasty when you give them and not listen to you so that it was of no use to give advice. The other still said one has to mind one's approach when giving advice. The majority of the respondents said both receiving and giving advice on safety is very important at the workplace.

Asked what measures they take to ensure safety at the workplace, most of them said that they apply the three whats ruling of site inspection, others mentioned wearing PPE, keeping to the rules, working safely with correct tools, thinking before doing anything, securing a work permit and being alert at all times. In response to the question what would you recommend in passing a word of safety advice to a new-comer colleague, the respondents hinted at aspects of the safety program of the company rather than anything deviating from the OSHA measures of the company. Some said safety comes first or think safety first; one said safety is for you not for the courts of law. Look after yourself, some said one should do nothing that one is not sure of, or understand what you do. Others said they would warn them never to hurry or do anything in haste. One said he would practice what he preaches. Some would say PPE and report unsafe acts, follow work procedures and listen to instructions. Experience is the University of Life; avoid learning from direct

harm, one said. Still others would say said safety is your own responsibility, others that they must always remember the three whats. One would say always watch out for dangerous species, these being common in his section. Others would say no short cuts. Another would say know what is right from wrong. One would say when something is wrong stop, or ask if you don't know and if you don't know a task don't do it. Observe all signs, and practice what you preach. Don't take chances. . To think of safety first and always be proactive. One respondent said he would warn of possible risks. One respondent mentioned that university students are always full of theory. At the plant they like to experiment a lot instead of asking whether it was risky. One said he would tell him as you came in one piece, leave in one piece. Anything can go wrong, the decision is yours whether you want to live or die. Others said safety begins with you. Before one can blame the company one has oneself to blame. One would say comply with the rules and another, keep your eyes and your ears open.

The Workers' Compliance with OSHA at Sasol

For questions that probed compliance, the respondents were asked to explain what they do when they come across a radioactive sign. The Sasol safety induction program points out that people should keep away from such vicinity; only specialists who work with radioactive material are allowed to work in at area. It is also stated that cellular phones have cells that work by emitting radioactive waves. When these come into contact with the plant's radioactive

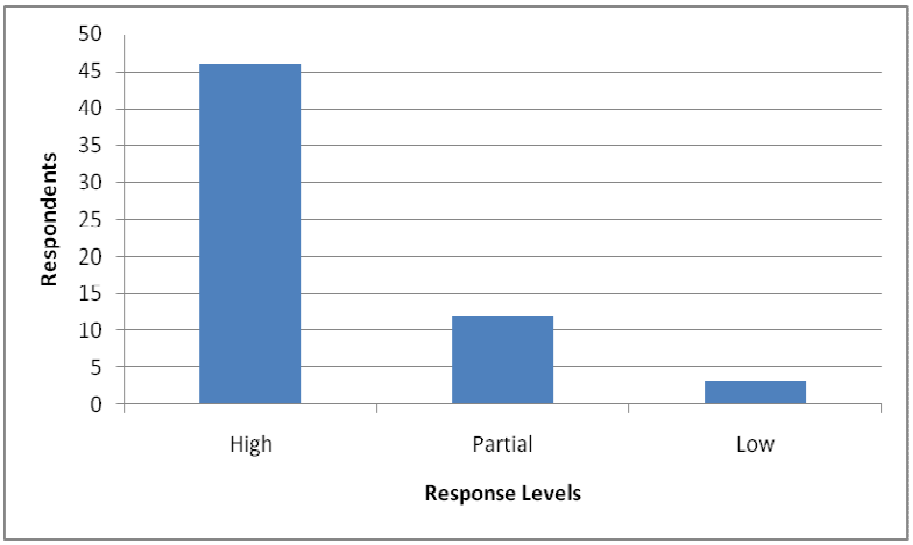


Figure 6. The workers' levels of compliance

material radiations, it can spark fires at the work site. A few workers were aware of the physical hazards posed by radiation while others simply knew that they had to keep away from demarcated radioactive areas but had no idea of the reasons for it. It is advised that workers should switch of their cell phones when they enter the plant, especially near a radioactive area. Of the 61 interviewees 7 candidates had no clue about the radioactive sign at all. Of those who knew the radioactive sign and what to do when they saw it and the demarcated area only four respondents knew the relationship between the radioactive area and the use of cell phones in the vicinity. Of all interviewed respondents, only one stated that he is a radioactive worker and knew what PPE he should wear in the area.

When asked how often they hear an alarm ring at the workplace and what do they do when they hear it. Only two workers stated that they seldom hear an

alarm ring from their side of the plant. When asked how frequently they heard the alarm go off at work, they said it might be once in two weeks. Most workers answered every Thursday at 11h00, while others said 10h00 and early Sunday mornings. Some said on Mondays or Tuesdays. Still others said quite often. They also highlighted that these are often equipment testing alarms, and that; at times mock emergency alarms are sounded to help drill the workers in proper response to emergencies. Most of the workers mentioned that they go to the emergency gathering room (EGR) while others said they simply listen to the intercom speaker system for what action to take. Others stated that prior to any alarm warning, the intercom system gives the instructions to be followed. Some of the respondents stated that they look at their watches to check if it is the usual testing alarm time or not and do nothing much but continue with their work. Others stated that they follow alarm procedures and still others said they ascertain from colleagues and their immediate supervisor what it might be for. When asked why they react as they do, all answered that it was for their own safety.

When asked if they have ever experienced a gas leak or fire burst at the workplace 20 respondents said ‘yes’ while 41 said ‘no’. To the follow up questions as to what they did or what they would do at such time, of those who had experienced it some mentioned that they rushed to the EGR. Others said the condition was within their powers and that they could effectively extinguish the fires. Two respondents said that they had to ensure that the workers were safely guided to the EGR and went about investigating the matter as designated safety representatives. The company rule says workers

should remain calm at such times. With regard to staying calm some felt it would depend on the magnitude of the fire burst since people respond differently to various stimuli, others felt there was no point in worrying since one would be dead anyway, there would be no need to respond. One respondent said that he once experienced a fire burst at a workplace and found it is possible to stay calm. Another respondent said that it is not easy to stay calm when you witness someone in trauma. One reacts spontaneously reaction. Other workers believed it might not be easy to stay calm but people should at least try to be calm because much harm to others can be caused by running and excitement; besides, it is procedural to stay calm. Sasol states that workers are not supposed to use defective tools.

Sasol states that workers are not supposed to use defective tools. When asked what they do with a defective tool some said they report it to their immediate supervisor (IS), others that they destroy and discard it, still others said they recondition the tool and use it again, while yet others said they take it along as evidence when requesting a new tool, still others said they do not make use of tools and some said the question does not apply for their section at all. A few had no idea whatsoever of a defective tool. When asked if they could tell the difference between a safe working condition, and an unsafe one, one said the plant has already been made safe for working in his section. Another said he knows it but can’t explain it. One also said that there are no safe working conditions since every workplace has its risks. Others said the place is as good as their gravesite. It is always risky and needs constant vigilance. Many mentioned that a place with good housekeeping is a safe

place where good housekeeping is not followed it is a risky working condition. Others said to work with the proper PPE is a safe condition while to work without it is risky. One worker mentioned that to work cooperatively is safe but to work without cooperation is risky. Some mentioned that to work without scaffolding is to work unsafely but to work with scaffolding is safe. It was said that if there are leaks at the work site it is not a safe working area while without them is safe. Reference was made to the official preliminary inspection as establishing a safe working condition than. Others said a risky condition can cause harm and a safe one is when harmful conditions have been ameliorated. One respondent stated that it is safe to work with a standby at your side and risky without one. Others said to take short cuts is unsafe and to follow working procedures is to work safely. One mentioned that to sit on an unstable chair is risky. Another said to ride on a chair is unsafe but to sit straight on one is safe. It was also said one can only ensure a safe working condition by not trusting another and that one needs to be always vigilant oneself.

To work in an unsafe atmosphere such as an ammonium field space is riskier than to work in a well ventilated area, so it was said. Some stated that to neglect the signs that are found in the workplace is unsafe while to observe signage is to act safely. If risk assessment is done then the place is safe if it is not done it is an unsafe working condition others said. To be always alert at the workplace is to act safe. Working on a live or on an un-isolated line is unsafe said one worker. One said to work in a noisy environment is always unsafe as is working with hot or cold substances that need constant vigilance.

Using a defective tool too was mentioned as unsafe. Another said if there is not sufficient lighting there is greater risk than when there is sufficient lighting. Where there is the likelihood of falling objects on site it is not safe it was reported. To use a tool correctly is safe; to use it abusively is not. One also reported that bending the rules is to work unsafely. When one is uncomfortable at a site, it is more unsafe, than when one is at ease at the worksite. To work with pipelines that are constantly under pressure is always unsafe since they may erupt at anytime, one said. These need constant alertness.

These responses reflected a full exposure of workers' understanding of importance of the safety program of the company to them. These responses mirror the intensity of Sasol's safety program and the impression it has left on various individuals and its sense given the exposure to risks. This does not preclude that the respondents were not aware of or familiar with the program in every detail but they knew the context of the question and each raised the first safety condition that came to mind at the time of the interview.

In the focus group workers confirmed that the morning safety presentations vary according to individuals who are not equally gifted in handling safety measures. As to short cuts the group highlighted that if punitive measures are not imposed or are delayed against the perpetrators short cuts are likely to continue. It was also said that those in authority should lead by example when it comes to safety matters. The respondents mentioned that incidents occur most often around lunch times. This could be the time for short cuts and

rushing to finish certain tasks. With regard to PPE they confirmed that the issue varies from site to site as to whether it is necessary or not. With regard to work permit delays it was said that the company has a new program in place to help ameliorate work permit hassles and delays for the workers. The company is still geared towards zero incidents and everyone has to play his role responsibly and effectively.

The researcher's participant observation convinced him of the researcher has witness excellence in house keeping at every plant. The workers have personal work stations that are spick-and-span. Individual workers work in spacious, well ventilated and illuminated areas in which as the workers confirmed the temperature is constant throughout the year. Floors and walkways are well marked. Fire extinguisher directions and locations are clearly marked and well known to the workers. The researcher too had to adhere to workplace safety rules and PPE observance at certain plants. Readily available PPE was supplied to the researcher by floor managers. There are sites where the researcher was not allowed to walk on his own; transportation was supplied by Sasol to reach areas of interest for further interviews. In the process, the researcher was escorted from one site to another. This provided opportunity to ask questions of interest to the study from various individuals who also facilitated an impromptu plant orientation. There are sites where access to the actual workstations was not possible, for instance the laboratories.

Conclusion

This chapter has put forth the findings from workers' responses as to how they perceive Sasol Infrachem's OSHA measures. These perceptions have proved to be different due to differences in human perceptual orientation. This chapter has revealed the role that individuals play in ensuring safe or unsafe working conditions for themselves and others in the workplace. Fears and skeptical concerns were expressed by different workers about workplace safety. These are not due to plant insecurities as such but derive from various attitudes exhibited by different human beings and from behavioral changes. The workers unequivocally revealed that hazardous workplace incidents and accidents stem from human inclination to error. It is intriguing to note that these people who were all subjected to one and the same safety induction program should express various opinions over aspects raised in the program for a common cause. The next chapter will analyze these sentiments in relation to other scholarly perspectives from the literature. The purpose driving this research is not to witch-hunt or to discover floors at Sasol but to establish the role played by individual differences in ensuring safe and unsafe working conditions for workers' safety in the workplace.

CHAPTER FIVE

The Discussion of the Findings

Introduction

This chapter contains the discussion of the findings that have been reported in Chapter Four. The responses of the interviewees are discussed in terms of the objectives of the study. The results are reflected from a broad-spectrum point of view as Sasol Infrachem responses rather than as responses from the several business units at Sasol. It was not the intention of this research to do a comparative analysis of the various business units at Sasol Infrachem. The presentation is in stages, each of the objectives being discussed and represented in a pie graph format. The chapter includes a discussion of the findings in relation to various literary reports, dealing with aspects raised in the discussion. This involves a general analytical reflection of the discussed material from a theoretical framework's point of view.

The Workers' levels of Understanding

Sasol seeks to ensure that all participants have a clear understanding of the general health and safety rules of the company as the ultimate objective of its OSHA strategies (Sasol Safety Induction). It goes without saying that any response contrary to the company's main objective is a matter of concern. Sasol holds workplace safety to be of immense importance. The pie graph

above reveals how different the workers' levels of understanding of the OSHA of the company are. Understanding a concept is a fundamental

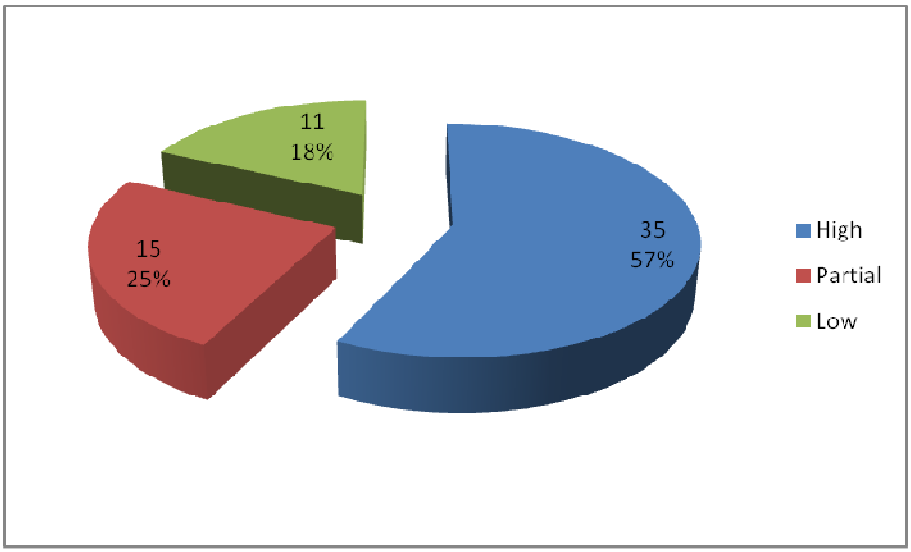


Figure 7. The workers' understanding of OSHA measures

prerequisite before one can meaningfully reflect on its significance and respond according to the concept's stimulus as expected. Understanding is the ability to think and to act flexibly in terms of what one knows proficiently (Perkins and McGinnis, 1996).

As indicated earlier in Chapter Four and in the graph above, the L group respondents revealed a poor understanding of the Sasol OSHA plan. They knew very well what good housekeeping is all about and the procedures that need to be followed in cases of emergency but had no idea of what non-flammable cleaning materials are. Other respondents in this group had no idea of what constitutes a defective tool neither could they decode the

meaning of signs that are used by the company. The signs appeared strange to them.

This group raises much concern with regard to how the company expect them to act when they come across these crucial safety orders. People are forgetful. One safety official at Sasol stated that workers seem to be weighed down by the daily safety talks over and above the five day safety induction program that would be followed by a plant specific safety induction series at Sasol. There could be underlying reasons here as to why some of the information is forgotten by the workers. One cannot entirely dismiss the role that the excitement and anxiety of starting a new life at Sasol could play within the workers. It could have impacted on the concentration span of the new-comers. One of the interviewed long time senior officials mentioned that the biennial safety induction could be tedious at times and as a result they tend to lose out on some of the important new information because of involuntary passivity while the course is conducted. One of the safety representatives blatantly stated that at times the biennial safety inductions are a waste of time.

This group constitutes a group of concern to those workers that reveal advanced knowledge of Sasol's safety measures. This is the group that is perceived by competent workers as prone to occupational safety hazards at the workplace. Understanding is the key element of competency. A state of incompetency in an individual is perceived to be an occupational risk at the workplace by the workers who know the value of asking when one doesn't know any or some of the workplace safety proceedings. The P and the L

groups are groups that are viewed as prone to erring and might unwittingly bring about incidents in the workplace according to the workers. It goes without saying that before one can comply with any rule one has to show understanding of the rule by being able to explain one's understanding of the rule (Perkins and McGinnis, 1996). A person who does not know what a flammable material is, is more likely to make use of one unwittingly, the same can be said about the concept of a defective tool. It is unlikely that one can attach value to an object when one has no clue whatsoever of the concept of the object (Pirzadeh *et al*., 2007).

One of the workers when asked what could be the reason for the use of a defective tool in the workplace he stated that he does not make use of a defective tool in the workplace, but those who do, may do it from the comfort of being used (familiarity) to the tool, to the point of blithely trusting the tool and to avoid the hassle of reporting a defective tool and getting a new one in its place. Sasol insists on safety induction for every person that enters its premises. The respondents confirmed that service providers are also exposed to the Sasol safety induction. The workers have suggested that negligence about OSHA measures does occur at Sasol. They said to have detected defective tools used by private service providers contracted to the company. When they were asked how they responded to that, some said they reported the matter to their IS while others said they confiscate the tool irrespective of production time losses, because such tools put people's lives at risk as well as the reputation of the company. These respondents mentioned that a

defective tool is very likely to snap, cause harm and immense damage to plant equipment.

To ensure safety at the workplace requires a proactive stance from well informed workers. Thus understanding of the safety strategies and stipulations of the establishment becomes crucial. This impinges directly on the moral values of an individual. To adopt a proactive stance in order to enforce an ethical climate in the workplace is every individual's duty. Everyone has to keep to the rules and procedures of an organization in order to ensure a safe working environment for themselves and other workers (Elsi and Alpkan 2008).

The Workers' levels of Vigilance

A petrochemical operation like Sasol demands constant vigilance from the workers. Vigilance requires one's active involvement with safety alertness necessities, thus, knowing plays a significant role before one can be competently watchful. That is why Sasol has put in place a vigilance credo that before a worker can carry out any given task he/she has to do self-inspection of the worksite using the 3 whats credo. Workers have to ask themselves what can go wrong, what can cause it to go wrong and what can they do to prevent it from going wrong. This gives the individual responsibility to make sure safe working conditions for him/herself when at work. If there is unease or a suspicious working condition one has to report it. Before one can carry out any maintenance duty one has to secure a work permit to do it. Prior

to issuing a work permit, a preliminary inspection by a respective official is carried out.

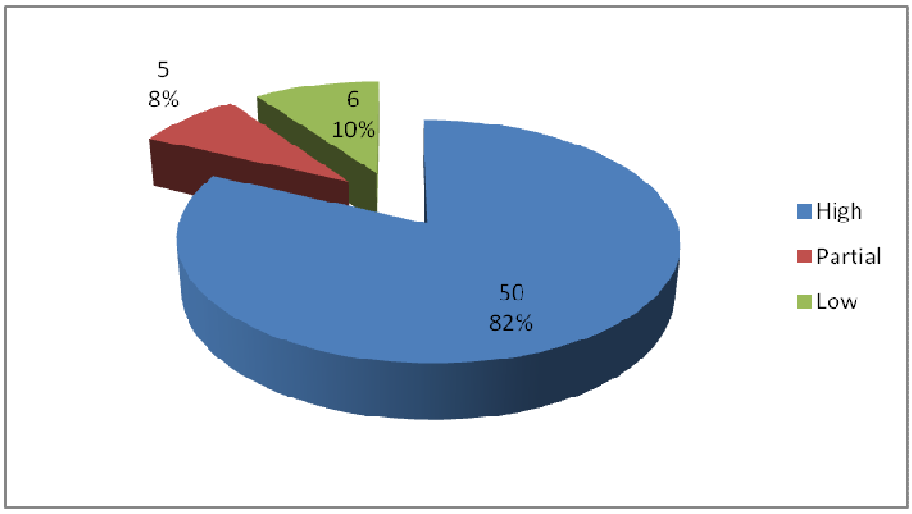


Figure 8. Levels of workers' vigilance at work

One respondent in the P group, in response to the fitness question said that he guards against work conditions that distract and disturb one's attention at work among them disturbing remarks by seniors. To do things right the first time has been the rational objective behind the formation of the ISO standards and OHSAS. It requires timely anticipation of and alertness to potential problems. It is stated that this can is only possible when workers are able to identify problems and to solve them directly, this principle cannot be executed from the top to the bottom but from the bottom to the top (Zwetsloot, 2003).

The L group is made up of those who are aware of the roles they should play in ensuring safety in the workplace but have no clue whatsoever of what unsafe risky conditions they should vigilantly guard against nor of the signs of

emergency that need to be reported when detected. Such individuals are unlikely to report suspicious factors that may cause incidents at the workplace. Their capacity to be vigilant is compromised by their faulty state of knowledge of the crucial basic information about concepts that pose risk at the workplace. One respondent from the H group commended the company's stance to come down on liquor abuse through daily breathalyzer tests and observed that the frightening trend currently posing workplace hazard are stress related emotional disturbances. Stressed workers are perceived by other workers as potential safety risks. The workplace does not allow people with divided attention at the work sites. Sasol has introduced psychological problem call centre for workers support in this regard. An apathetic worker or a worker who is not aware of the risks that go with the health status of a fellow worker, might not be in the position to report such a case and might lack courage to raise the matter with the person who is at risk of hurting him/herself and others at the workplace. Poor health and well-being in the workplace may affect productivity and reduce effective quality decision making, and is detrimental to one's contribution to the organization (Boyd 1997; Price and Hooijberg 1992; cited in Danna, 2005).

The question, who is responsible for ensuring safety in the workplace was answered differently from the rest by only 5%. These five respondents tended to shift their safety responsibility to the seniors (who could nevertheless constitute the most compliant group on the other hand arguably), as being the duty of the safety representatives or the safety manager. The majority of the respondents replied that it is everyone's responsibility or their own

responsibility. It is not the purpose of this study to regard the responses as either wrong or correct but to view these in terms of each other and what is expected of them by the company as made clear during the same safety induction program. It is improbable that someone else can ensure a person's safety while the latter behaves in a slipshod manner. These individuals may well be taking care of their personal safety but their position as to vigilance is questionable and raises uncertainties. They are more likely to be lax in the workplace than to be vigilant. This does not necessarily mean they are badly informed but they might rather be more laidback than vigilant at the workplace. Safety at work demands joint participation. The motivation to participate is directly linked to both safety compliance and safety participation (Parboteeah and Kapp, 2008).

Sasol unequivocally states that both the employer and the employees are responsible and have specific roles to play in ensuring safety in the workplace. Workers stated that they are duty bound to report incidents and not keep them to themselves, for this will help the officials to prevent someone else from being hurt. This calls for vigilance against any probable incident that may arise at the workplace. Other respondents mentioned that those who do not report incidents or warn perpetrators are just as liable, as accomplices in hurting others, according to the company rules. One respondent unwittingly displayed a sense of negligence in mentioning that she once experienced a paper cut on her finger. Laughingly she stated that she never reported it, despite knowing the possibility of developing gangrene in her finger. It seemed so trivial to her and ridiculous to report the matter. One quite elderly

respondent stated that safety is a state of mind. He finds it ludicrous that a worker who fully knows that he has to report for duty the following day would indulge in a liquor spree the day before that may compromise alertness at work. He sees this as an irresponsible act that often leads to sick-leave abuse. Reflecting on reporting, he said that by reporting someone one is helping oneself and other workers and helps build up a safety culture history. Refraining from reporting leaves everyone in the dark about the occurrences, nobody knowing to re-act and rectify the matter and prevent its occurrence. He went on to mention that one has to report even when one is implicated oneself; one may face harsh reprimands but at least one would have played one's role responsibly. He raised his concern and doubts about worker vigilance in the plant (as an office worker) and said that some would sleep blissfully or would go to lunch while others are working with no one to watch their backs. He regards it to be an unsafe act that shows lack of vigilance.

When asked what they would do in case of emergency most workers said they would grab any nearest person and run to the emergency gathering room (EGR). Parboteeah and Kapp (2008) agree that local safety climates tend to be somewhat controllable by managers. The workers highlighted that it is the policy of the company to have anyone be responsible for a fellow worker. This ruling is inculcated through calculated motivation driven by the fact that workers are legally liable for any incident that may happen to an individual while they were aware of the pending danger but refrained from warning a fellow worker about it. Infringement of this ruling draws harsh punitive measures that may lead to conviction and expulsion. Monitoring and

corrective actions are costly and are only useful due to the problems that had better be prevented (Zwetsloot, 2003).

The South African constitution states that a person has a right to refuse to carry out any unsafe work. It is not possible for the employer to be at every worksite to ensure safe work for everyone neither is it possible for safety officials. The workplace regulation states that it is the duty of the employer to ensure compliance at the workplace. This has serious legal implications for both the employer and the employees. To refuse to carry out unsafe workplace procedures helps to ensure safety at the workplace. Really, to risk working then is in contravention of the law (LexisNexis, 2007).

The company has trained every employee concerning things to be vigilant of and to guard against, things that need to be reported when detected. It raises concern to find that there are individuals who seem to have no clue whatsoever about such factors. Their state of vigilance may be compromised to a certain extent. One respondent reflected that to drive a vehicle within the company premises without fastening the safety belt is a criminal offence that can even result in expulsion from work. The question is, what are the odds that a worker who is not aware of such a clause should drive, unwittingly, a car within the company without fastening his seat belt? The same can be said about other risky behaviour.

Vigilance is of prime importance for every individual before the company can achieve its zero tolerance targets to bring to an end targeted incidents and

accidents in the workplace. According to Saurin (2005) (cited in Oliveira and Almeida 2008) an accident is an unplanned instantaneous occurrence that results from a human's interaction with its physical and social work environment that causes incidents and material damage. Unsafe acts are defined as events where the danger situation results from the continuous negligent action of one or more workers over some time (Filho 2001, cited in Oliveira and Almeida 2008)

The Workers Attitudes towards OSHA at Sasol

As to attitudes towards Sasol's OSHA in the workplace this study reveals that the workers' attitudes are highly positive towards the safety measures of the company. Attitudes can either be positive or negative. Attitudes are the favourable or unfavourable evaluative reactions towards something or someone, manifested in ones beliefs, feelings or intended behaviour (Myers, 2002). As indicated in the pie graph 87% of the interviewed respondents hold workplace safety measures to be highly positive (P). In probing attitudes by way of a trick question, that is, about short cuts in the workplace and the importance of PPE, one worker believed that one can work without PPE and that it is simply to keep to the rules that they wear it so as not to land into trouble in case of an emergency. Otherwise the worker would work without PPE if the punitive measures that go with the ruling were lax at the workplace. Non compliance brings about very serious implications in case of incidents at Sasol. This kind of adhering to stipulations implies that the worker's attitude is harnessed by a calculated motivation to comply with the rule to avoid non-compensation punitive measures.

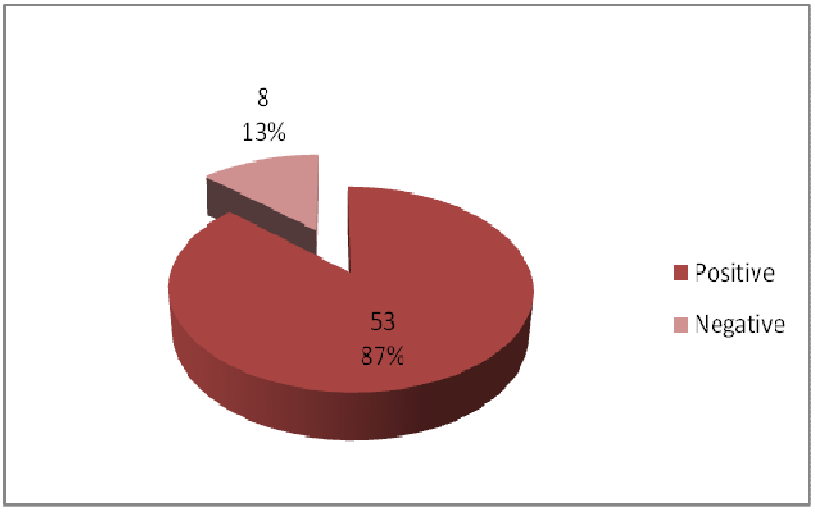


Figure 9. Workers' attitudes towards OSHA at Sasol

This study revealed that when workers are made fully aware of the OSHA measures they are more likely to conform to workplace regulations and to those who expressed negative sentiments could easily come to modify their attitudes. Attitudes are capable of change. Those candidates who were not fully conversant with some of the safety measures showed attitudes towards Sasol OSHA measures that were not necessarily negative but they were different. One respondent felt he is more safe at work than at home while another felt the place is as good as their grave yet their attitude towards Sasol's OSHA measures were both positive. These two held different opinions about the same place, their workplace. Attitudes are governed by values that differ from individual to individual. Values are criteria that people use to select and justify behaviour and to evaluate themselves, other people and events (Schwartz and Bilsky1990; Schwartz 1992, cited in Pirzadeh, 2007)

The majority of the workers voiced interesting opinions about Sasol's OSHA measures pertaining to short cuts. The workers perceived short cuts as dangerous risky actions that carry massive human life, plant and administrative costs. In one department one substantiating argument was that when working with documents one may ignore some of the essential requirements. As documents get checked while move from one official to another including audits, somewhere down the line someone will pick it up. This implies that short cuts can be draw-backs in that one has to redo the work assumed to have been done. This has other implications for the company in terms of time and paper wastage. If other businesses are involved in the chain it implies unnecessary delays. That puts the reputation of the company and the business unit at risk. Some of the workers found working without a permit to be one form of a short cut. One respondent felt that short cuts will never come to an end especially on Mondays and Fridays. This candidate expressed a positive attitude towards OSHA measures but is fearful of for human behaviours that tend to compromise safety at the workplace. Some workers see lack of planning and laziness as a cause for short cuts. This impinges directly on the human capacity to see and do things differently. One respondent mentioned that in hurrying one may miss proper measurements that could result in catastrophic outcomes. This boils down to the ethics dilemma that lies within individuals' attitudes. Such action not only compromise workers' lives but also compromises production quality. These workers referred to out daily experiences that compromise safety at the workplace. From the spontaneity of the responses one could presume the frequency and the exposure of the workers to such phenomena,

notwithstanding the daily exposure to safety precautions with regard to typical short cut orientations. One cannot entirely dismiss the idea that the workers see these occurrences in the workplace on a daily basis. This study does not preclude the fact that the respondents expressing these sentiments could be the very individuals implicated by these responses.

The OHSAS 18001 act (NOSA 2007) condones the idea that workers have a right to refuse to carry out an unsafe job. It is the responsibility of the employer to notify the workers of the potential risks in the plant and to see to it that the workplace risks are mitigated before any worker can accomplish any task assigned to him/her. The regulation also states that it is the duty of the employer to ensure that workers comply with the orders of the regulation. According to this regulation before a worker can accomplish any task assigned, he in turn has the responsibility to ascertain that the task that is to be carried out is free of risks and that inherent risks have been ameliorated. This means that workplace safety has a legal dimension and is more than just a workplace policy in order to ensure the safety of others. Sasol has instilled this ruling through the three whats to workers in developing a safety culture. This is the company's initiative in shaping the attitudes of the workers towards a proactive stance of 'doing the right thing' from the start, a top down approach to safety that complements 'doing things right' as a bottom up strategy (Zwetsloot, 2003).

One respondent stated that people change. One day they conform the other they do not. People's attitudes are governed by many factors that affect their

moods and behaviours. At one time they comply with the rules, the next they don't. Many respondents implicated domestic problems as responsible for mood swings. Others mentioned that the morning safety talks help to stimulate alertness because when they come to work from home the mind is lax and this makes them vulnerable to workplace incidents; hence they hold morning talks in high esteem. They find these to help create and set the mood for an ethical safety climate. Value constructs are numerous and play a significant role in creating an ethical climate. These play a significant and influential role in creating interpersonal situations. They may affect an individual's behaviour unwittingly (Pirzadeh et.al 2007).

Human well-being is of major importance in the workplace. Ethical climate is one of the factors that help shape intra-organizational relationships and employee attitudes that exert considerable impact on organizational outcomes. Thus, to understand the relationships between organizational ethical climate and employee attitudes and behaviors is very crucial towards safety in the workplace (Elci and Alpkan, 2008).

How Workers Take Ownership of OSHA at Sasol

The workers showed themselves keen to take ownership of the OSHA measures at Sasol, 90% (H) of the respondents exhibiting an unambiguously high level of taking ownership of the OSHA measures. Nevertheless there were individuals who reflected partially (P) different responses to taking ownership of Sasol's OSHA strategies. This group comprises 10% of the interviewed workers. Some respondents' opinion about repeated safety induction programs was that they can be a waste of time, but still, like the

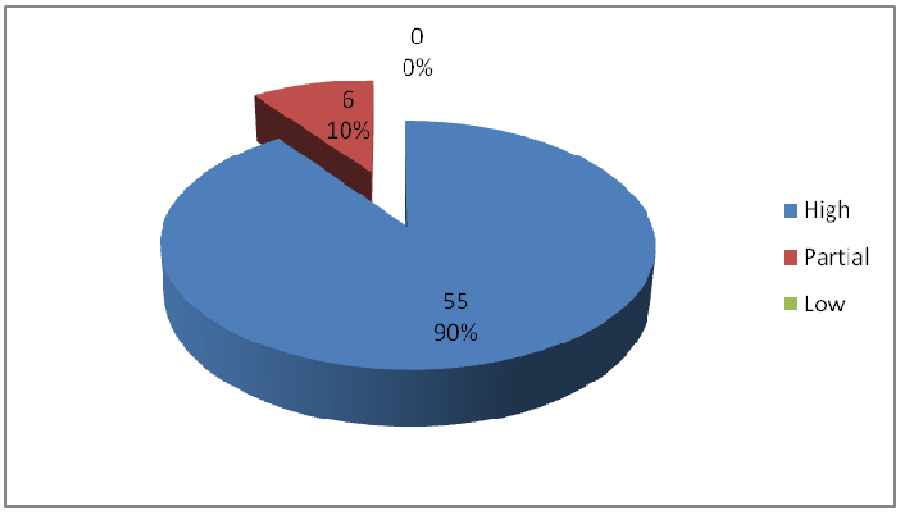


Figure 1O. Taking ownership of OSHA measures

majority of the respondents they perceived the daily five minute safety talk at the beginning of every work shift as very good and essential. The workers tend to attach more value to the pre-shift safety talks in the workplace. One respondent mentioned that the home environment is a very comforting environment that affects the state of the mind of the worker. When they report for duty it is very necessary that one be aware that one is entering a different environment. The workers have adopted these talks as a life style element (culture) analogous to prayer in a church service. It is a program that stimulates personal safety experience in life generally in work experiences, but also in social events and in doing domestic chores. It is part and parcel of Sasol's strategies of inculcating a safety culture inside the company.

As people are forgetful, frequent utilization and exposure to safety concepts helps reinforce the imperative essence of the concept in their minds more than could one brief encounter in a long while. It is stated that brief exposures

to concepts tend to produce significantly little glimpses or no effect at all of concepts as compared to longer stimulus exposure to the concepts of concern (Ramsay and Overgoard 2004). With regard to taking ownership of the Sasol OSHA strategies a safety culture proves to have been effectively inculcated amongst the respondents. The study reveals that 90% of the respondents buy in to the safety measures of the company. Their confidence in the OSHA measures is explicitly positive as has been highlighted in the previous chapter. In response to the question of what safety tip they would give to a new comer at work, 90% of the responses referred to the OSHA measures of the company. When the respondents were asked a general non-safety induction question that is what could be the cause behind workplace incidents, all respondents implicated human behaviour as accountable for 99% of the workplace incidents. When asked whether workplace incidents can be avoided, two thirds of the respondents said 'yes by sticking to the rules' this phrase reflects absolute trust in the OSHA measures of the company. Those who said 'no' still attributed the cause to human behaviour, implicating negligence and non-compliance as a prime factor behind workplace incidents. The fact that this group finds it impossible to reduce workplace incidents or that these cannot be avoided does not imply disapproval of Sasol safety measures as such, they find neglect and non-compliance with the OSHA measures as the reason for their sceptical stance. All workers hold the OSHA measures in absolute respect. It is individual human differences that all workers find difficult to control due to different lifestyles and values. People differ, it is difficult to make them think and behave in a uniform manner. That is the great challenge, were it not so the

prisons would be empty. The Sasol workers reveal absolute trust and confidence in the OSHA measures significances as crucial and imperative to ensuring safety in the workplace. If team members are constantly passing the buck rather than taking ownership for their part of the pie, then accountability becomes a problem (Rose, 2006).

The workplace regulation of South Africa states holds in no uncertain terms that it is the responsibility of every worker to ensure his/her safety in the workplace and that of fellow workers (NOSA 2007). Every worker has a right to life. Rights are certain basic important inalienable entitlements that should be respected and protected (Crane and Matten 2004, cited in Bulutlar and Oz, 2008). One respondent stated that procedures at work are put in place for a reason. To keep to them is to act safely while to neglect them is unsafe. The ILO states that the objective of OSHA measures is to promote and maintain a high degree of worker physical, mental and social well-being in all their activities (ILO cited in Oliveira and Almeida, 2008).

The Workers Compliance with OSHA Measures

Complying with workplace rules and regulations is the ultimate key to safety in the workplace. Enforcing a rule is to ensure safety through compliance. A safe working condition is determined by the level of compliance with the safety rules (Parboteeah and Kapp 2008). At Sasol the study revealed a high level of compliance that stands at 75%, followed by a 20% of respondents who reveal partial (P) compliance. The P group could not say clearly what to do with a

defective tool while the L group had no idea of such a tool at all. The chance that these would report a defective tool, should they come across one is

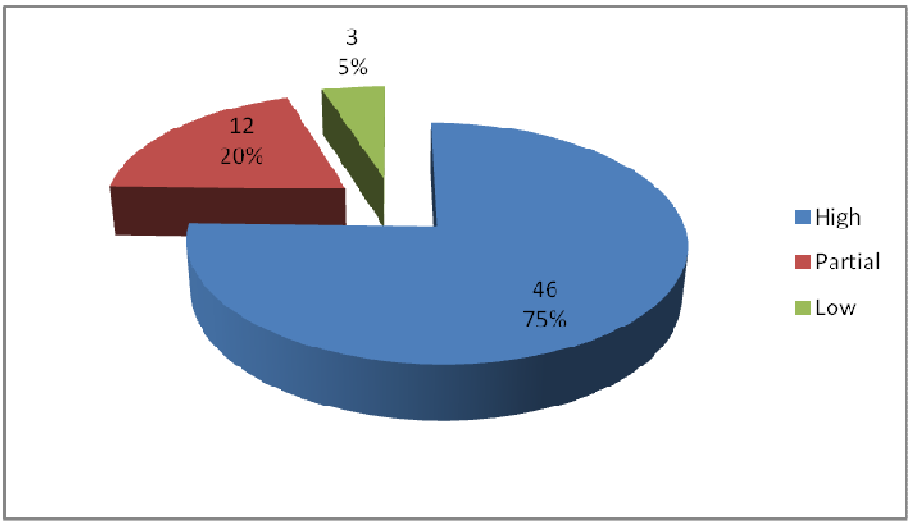


Figure 11. Workers' safety compliance

negligible. The same goes for unsafe acts. Benevolent caring is essential to workplace safety. Care ethics maintains that human beings live and work in relationships with others with whom they share mutual feelings and strong ties (Held 1993, cited in Bulutlar and Oz 2008).

Three of the respondents form the L group. One of these believed that a defective tool can still work but it is risky to use it hence it is not allowed at the workplace. Such a person is prone to negligently take a chance with a defective tool, rather than discard it or reporting anyone that makes use of one. There are individuals who said that they cut a defective tool into pieces and throw it away to ensure that no one comes across it, in so doing ensuring a safe working condition. Others stated that they re-sharpen or recondition it

and use it again depending on the nature of the tool and the extent of the damage, while yet others mentioned that they simply report the matter to their immediate supervisors. Various plants tend to respond in various ways to the question.

It is clearly stated during the safety induction that workers should not make use of defective tools. It is possible that various plant specific inductions have different types of tools that hold different perspectives towards utilizing these. There are individuals who are genuinely prone to comply who stated that the workplace is as good as their graveyard and demands total vigilance. These said that they can hardly trust the pre-inspection that is conducted by authorities due to human capacity to err; they believe that even such inspection cannot warrantee 100% safety; hence the three whats vigilance approach is important for everyone. Before one can ensure one's own safety and that of others in the workplace compliance with workplace procedures is must be ensured. To achieve workplace safety will always depend upon individuals' capacity to comply with workplace procedures. The motivation to perform and comply with workplace procedures is an important precursor to actual safety behaviour (Griffin and Neal 2000, cited in Parboteeah and Kapp 2008)

When the workers were asked how they respond to the radioactive sign, they indicated that under normal circumstances it would be a demarcated area and that they would keep away from it. Eight respondents of the 61 had no idea of the radioactive sign. How they would re-act should they come across such a

radioactive sign. The question is will they be able to demonstrate the desired response? It is unlikely that a person who does not know the risks that go with radioactive work would comply and respond as appropriately as the person who knows the risks involved. One respondent stated that as a radioactive worker he knows the PPE that should be used when working in such an area. This was one of the few who could explain the relationship between the radioactive area and the use of cellular phones in such vicinity. Most of the respondents were aware of the implications of the radioactive sign but were not aware of any relationship between the radioactive zone and cellular phones. This might also mean that these candidates are unlikely to comply and respond as expected should they come across a radioactive sign. It is stated in the company safety induction program that in the vicinity of a radioactive sign and in the plants cell phones should be switched off. These might not be able to respond responsibly in a safe manner and are vulnerable to workplace incidents whether in the short or long term. Safety is a set of actions that have to be displayed by workers and be carried out at the workplace to reduce damage and loss caused by aggressive agents to humans, property and the environment (Cadella, 1999; cited in Oliveira and Almeida, 2008).

One respondent when asked if he could differentiate between a safe and an unsafe working condition stated that to him adhering to laboratory regulations makes for a safe working condition and compromising the laboratory regulations would make it unsafe. In essence the respondent meant that, to comply is to act safely and not to comply is a risky condition. It is evident that

the workers' perception of a safe working condition has been internalized and is expressed as safety awareness beyond mere observation of the regulation. Motivation for safety participation is considered to be the degree to which employees are determined and geared to participate in activities dedicated to safety (Griffin and Neal, 2000; cited in Parboteeah and Kapp, 2008). The ability to comply with given rules and procedures is given with an individual's capacity to make ethical decisions. There are many variables that influence ethical decision making. These include amongst others age, religious belief and gender (Hergaty and Simms, 1978, cited in McDevitt *et al*., 2006) and maturity (Kohlberg,1969;Rest, 1986; cited in Mcdevitt, 2006). Other variables include confidence, situation and organizational context. Confidence goes a long way in determining an individual's character. Strong decision makers are confident enough to follow through on what they see as right. Weak decision makers are unlikely to depend on their own judgment but, instead on that of others in the team or those in authority for self-confirmation (McDevitt *et al.,* 2006). Situational decision making depends on pressures that could come from peers as in defiance of authority or from cohesive style of management. One respondent stated that short cuts are resorted to by workers who are given tasks by managers near the end of their shift in the expectation to have them finished before they leave work especially on Fridays. Workers at Sasol under normal circumstances stop working at 12h00 noon. In organizational contexts decisions may be influenced by shared norms, values and expectations. No one wants to be the black sheep in the family thus decision making is influenced. Organizational culture can be governed by both formal and informal codes (Schein, 2004; cited in McDevitt et.al 2006). Many

companies have put in place motivational systems to encourage and inculcate safe working conditions and to discourage unsafe action through incentives and punitive measures. This system has been found to comprise both positive and negative implications for the workplace. Some of the incentives happen to encourage unethical behavior and actions by managers. Companies have a culture of giving excellent bonuses in good faith to those departments that performed well in ensuring safe working conditions. On the other hand this mightforce the employees to compromise their lives and to refrain from reporting incidents and safety hazards in their workplace. That can facilitate these can facilitate non-compliance with some of the safety rules at work (Carson 2003; Hunt and Visquez 1993; Trevino *et al*., 2003;cited in McDevitt *et al*., 2006).

Hypothesized in earlier chapters the findings have confirmed that safety will always depend on the individual's motivation to comply. Notwithstanding the safety measures of the company however lucrative the measures might be, to ensure safety in the workplace will always be affected by and to a great extent depend upon an individual's perceptions. It goes with the character of an individual to comply and not to comply. It is only when the individual has a proper understanding of the safety rules that he/she may adopt and own it. After they have internalized and taken ownership thereof, their attitudes will have been modified. This in turn will lead to vigilance and compliance. Human beings are unlikely to observe a regulation if they do not have a correct perception of it. Human nature varies. It is characterized by different psychological impulsions and mood swings. These will always have a bearing on how people will respond to rules and regulations at any given moment.

CHAPTER SIX

Conclusion

This study has confirmed that there is a strong relationship between worker perceptions and safety in the workplace. The literature has established several factors that have a bearing on the link between human behaviour and workplace safety. In reality people are different. Their values differ, what others hold with high esteem might be considered insignificant by others. Some people derive pleasure from engaging in risky behaviours while others guard vigilantly against risks. Human nature is chaotic. If it is not harnessed effectively by the rule of law the wheel of civilization would stop running. Organizational establishments are faced with a huge challenge of enforcing safety compliance in the workplace. As in a soccer match, to maintain order one has to play by the rules. To ensure that order is maintained, the referee is put in place. The same applies to the workplace.

Sasol has full understanding on the part of all as the terminal objective of its OSHA measures. It is defined as one's ability to think and to act flexibly in terms of what one knows. Understanding is essential before one can respond correctly to a concept and show the correct response that is expected. Lack of understanding implies lack of knowledge which can render one incompetent. The study has revealed that when one cannot interact competently with a safety concept in the workplace, one poses a safety risk. Understanding

precedes one's capacity to comply with any given rule. People derive value from something they are familiar with. Therefore, they cannot attach value to a concept they are not familiar with. This has serious implications for conforming and complying with the given rules. Negligence and ignorance are inclined towards non-conformance and non-compliance with any given rule. Workers have to adhere to the rules to ensure safety in the workplace. To do so effectively require knowing what the rules are all about. The greater proportion of the workers demonstrated competence, but still some realise certain challenges remain.

A proactive involvement is one of the major requirements for engaging vigilantly with safety and health in the workplace. The company developed its 'three whats credo' to instil vigilance in the workers. This has been perceived by workers as absolutely significant in ensuring their safety and health in the workplace. They find it helps them to stay alert and vigilant at all times in the workplace. The study has revealed that the company did make workers aware of the possible workplace hazards at Sasol plants so as to vigilantly guard against them through safety P.P.E. and other safety ameliorating strategies. They are wise to report any identified possible hazard at the workplace. Failing to report a hazard constitutes a criminal offence. Vigilance facilitates reporting. To know risky conditions is to be empowered to act safely. By contrast lack of knowledge entails lack of vigilance. Unhealthy conditions pose workplace risks and leaves victims vulnerable to safety hazards. Vigilance speaks against being lax in the workplace. A benevolent behaviour is encouraged and enforced at Sasol. Accordingly workers are not only

responsible for their personal safety at the workplace but for that of other workers as well. Non-conformity to this rule has serious legal implications, as it puts other people's lives at stake as well as the reputation of the company. The non-vigilant they put their lives and career opportunities at risk of expulsion. The majority of Sasol's workers revealed a great propensity to be vigilant at work.

The majority (87%) of the workers at Sasol have shown positive attitudes towards the OSHA measures of the company. The study has revealed that the individuals that voiced negative attitudes as regards certain safety precautionary measures at Sasol do not necessarily disobey safety requirements. As much as they may hold contrary attitudes they are fully compliant with workplace stipulations. This means that safety compliance requires a willingness to participate despite the attitudes one may hold towards the rule. Such people comply from calculated motivation outcomes where as the majority of the workers who are strong decision makers, would comply based on normative motivation when the weak decision makers would simply be motivated by social factors. The study has revealed that when workers are fully aware of the OSHA measures of an establishment, they are more likely to conform to workplace regulations also that those who hold negative sentiments could easily come to modify their attitudes. Attitudes are not rigid but flexible and can be changed. One respondent testified to having been a reck-less driver until he got exposed to incidents associated with reck-less driving in the safety talks and changed his driving attitude . This confirms that safety attitudes can be instilled in the workers. The study has also

revealed that attitudes are fluctuating. The respondents concur that individuals are prone to mood swings. This has a bearing on the safety element at the workplace. They state that people comply with rules at certain times and not at others. Hence general and constant vigilance at the workplace is to be exercised..

The study has revealed that all workers hold an ethical climate at the workplace in high esteem. Those who believe that workplace incidents can be reduced as well as those who do not believe so, both take human capacity to error as the reason for their incidents. They reckon human behaviour to be the main threat to safety and health in the workplace. This confirms the position advanced in this study that to really ensure a safety environment at the workplace will always depend on each individual worker at the workplace.

The study has revealed that Sasol workers attach great value to the morning safety talks (pre-shift safety talk/tool box talk). They show a tendency to own the program. This seems to confirm the ILO's position on the active involvement of workers in matters that involve their lives at the workplaces. The frequency and duration of exposure to safety concepts seem to play a significant role in persuading workers to buy in to the safety program. The morning safety talks are brief and continuous on a daily basis, while the safety induction program is intensive and biennial. When asked a trick question as to what safety tip they would give in passing to a newcomer they all made reference to one or two of the OSHA measures at Sasol. This suggests that the workers have complete confidence in Sasol's OSHA strategies. When

asked what could be the cause of incidents in the workplace the workers refer to neglect of OSHA measures. This also proves their trust in the program. The workers hinted at the idea that the OSHA department of Sasol has played a very instrumental role towards inculcating a safety culture in the workplace although there are still challenges to improve worker behaviours and reporting. Individual differences are a safety threat not only to the company but to the workers in general as the study has revealed. The study has revealed that it is possible to reduce workplace incidents towards zero tolerance as the majority of the workers confirm. Enshrined in the South African constitution is the responsibility of every employee to ensure safety in the workplace. This has serious and legal implications since this reflect an inalienable entitlement to life that should be respected and protected (Crane and Mattern, 2004; cited in Bulutlar and Oz 2008).

Compliance with OSHA plans of an establishment is key to ensuring safety and health in the workplace. The level of compliance with workplace regulations also serves as a yardstick to measure safety at the workplace (Parboteeah and Kapp, 2008). Two thirds of the workers have shown a strong tendency towards complying with the safety regulations of the company. Though the business units differ their workers seemed to agree with each other on safety compliance and their responses tend to be unique for each business unit. The motivation to comply is essential. The other side of the coin is demotivation. The workers in the focus group said that if short cuts are not effectively dealt with, they are likely to continue in the workplace. Some of the workers were of the opinion that some of their seniors do not practice what

they preach. That could be demotivating and reduce safety compliance in the workplace. The literature has also revealed that some of the workplace safety enhancing incentives can have both positive and negative effects on workplace reporting. The incentives that are given towards encouraging safety behaviours can also lead to under-reporting of incidents and unsafe behaviours in the workplace. This means that as much as these can help facilitate compliance these can also facilitate non-compliance. Safety compliance goes hand in hand with ethical decision making at the workplace.

APPENDIX

Preliminary information to be supplied

Date	

Company		Business Unit	

1. Which age group do you belong to, mark with an (X) here below?

18 - 24	25 - 34	35 - 44	45 - 54	55 - 65

2. What highest level of education you have attained?

Standard	Sb. A - 2	3 - 5	6 - 8	9 - 10	10 +
Grade	R - 4	5 - 7	8 - 10	11 - 12	12 +

3. What language do you speak at home?

4. How long have you been working at Sasol?

0 - 1	2 - 5	6 - 10	11 - 20	21 - 30	31 +

5. How many years have you been working in another/other company or companies(combined if applicable) before you came Sasol?

0 - 1	2 - 5	6 -10	11 - 20	21 +

6. To which gender do you belong?

Male	
Female	

7. Where is your place of origin or home town?

Province	
Town/City	

Open - ended Questions

Category A Questions

1. What is good house keeping?

_____

_____

_____

2. What are approved non-flammable cleaning materials, give examples?

_____

_____

_____

3. What do the signs on next page signify the green, blue, red, orange and purple?

_____

_____

_____

_____

_____

4. How do you tell when a tool is defective?

_____

_____

5. What are you expected to do when you hear an alarm ringing?

_____

_____

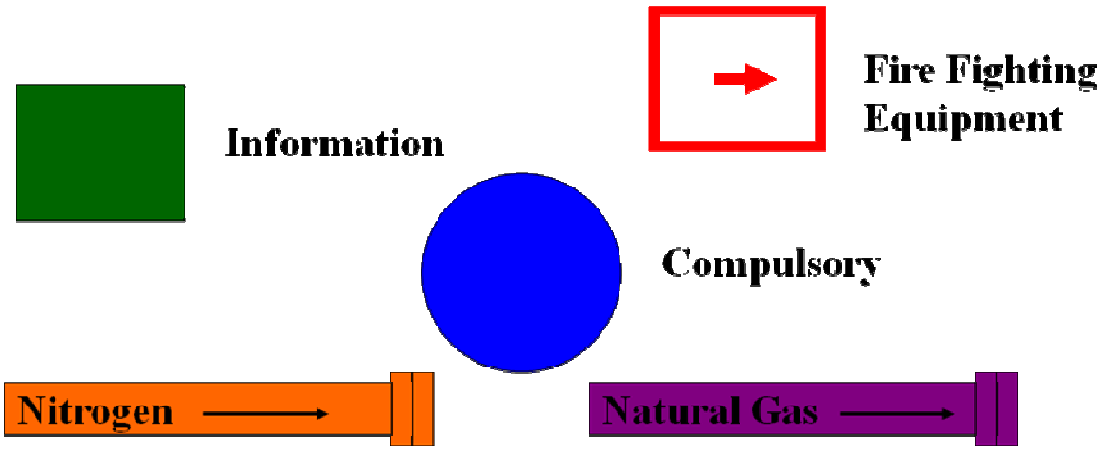
_____

6. What procedure do you have to follow when you see or experience a gas leak?

_____

_____

Signs for question 3 category A



Category B Questions

1. What should you do when you come across this sign?

_____

_____

2. How often do you hear an alarm ring at work?

_____

What do you do when it rings?

_____

_____

_____

Why do you do so?

_____

_____

_____

3. Have you ever experienced a fire burst or explosion at the workplace?

_____

What did you do when it happened (if not what would you do)?

_____

_____

_____

_____

4. How often do you use or come across a defective tool?

_____

_____

What do you do with it?

_____

5. Can you tell the difference between a risky and a safe working condition?

_____

How do you differentiate between the two?

_____

_____

_____

Category C Questions

1. The safety rules say take care, be observant of what can go wrong, what can cause it, and what can you do to prevent it.

   What conditions or signs of emergency are you always to guard against at your worksite?

   _____

   _____

   _____

2. What conditions or signs of emergency workers are to report at any time at the workplace?

   _____

_____

3. What flammable materials should you avoid using when cleaning?

_____

_____

_____

4. How do you tell when you are fit or unfit to carryout your work at the workplace?

_____

_____

_____

5. What do you do when you see a person who comes to work not fit to carry out his/her work?

_____

_____

_____

6. Who is responsible for ensuring safety at the workplace?

_____

_____

Category D Questions

1. What do you do when you have caused a spill or come across a spillage in the workplace?

_____

_____

2. Do you find it easy to pay attention at the tool box talk even though you know what it is all about?

_____

_____

3. What are you taught or warned against during the tool box talk at your site?

_____

_____

4. How helpful is the tool box talk to you?

_____

_____

5. Why are short cuts not allowed at the workplace?

_____

_____

6. Why is it necessary to wear the proper personal protective equipment in your type of work?

_____

_____

7. Do you think it is always necessary to wear it?

_____

8. Who do you think should be responsible for good house keeping after every work shift?

_____

_____

9. What is the importance of signing the work permit/time register at work?

_____

_____

10. Have you ever thought of it as a waste of time?

_____

Category E Questions

1. Who is responsible for your safety in the workplace?

_____

_____

2. What measures do you take to ensure that you are safe at the workplace?

_____

_____

_____

3. What do you do to ensure good house keeping at you kind of work?

_____

_____

4. Who is responsible for the prevention of accidents at your workplace?

_____

_____

5. What do you do with refuse when correct refuse bins are not in sight?

_____

_____

6. Would you rather receive advice or give advice to ensure safety at the workplace?

_____

_____

7. What would you regard as most important if you were to give advice to new-comer on workplace safety?

_____

_____

8. What steps do you take to know about your health and to stay healthy?

_____

_____

9. How often do you do so?

_____

_____

General Questions

1. People believe and put their trust in various things in life from western ideas scientific facts,religion and African traditions.

   Is there any of these in which you put your trust for your safety in the workplace?

   _____

   If yes, to which one of these do you believe in?

_____

   How does it protect you?

_____

_____

_____

_____

_____

_____

2. What do you think could be the cause behind incidents in the workplaces?

_____

_____

_____

_____

_____

3. Do you think workplace incidents can be avoided?

_____

Explain why do you think so?

_____

_____

_____

_____

THANK YOU

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