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# A valuation of leadership traits for sustainable safety improvements in mining


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**ABSTRACT**

Leadership traits compared with culture are viewed as a critical determinants of a sustainable improvement in mining safety. From this lens, crucial leadership attributes which may improve safety performance of the mine in a sustainable way were established. Previous studies have uncovered that the most successful and sustainable safety performance appears to evolve in an organisation where the senior executive takes on the role of chief safety officer.

Due to the mining context pressures, mine leaders often continue with their autocratic styles and orientation to enforce safety compliance. They thus tend to disregard signals that their orientations are no longer valid. New and relevant leadership attributes appear to be more effective.

The attributes of a successful mine leader include: caring for people; ability to lead change, trustworthiness; ability to communicate expectations effectively; less tolerant to deviations from safety standards; embodies team work; action oriented; fosters inclusiveness in the workplace; ability to relate with employees at all levels; and values the contribution of others.

**Keywords**: leadership traits, leading change, sustainable safety performance, caring for people

**DECLARATION**

I declare that research project is my own work and it is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration (MBA) at the Gordon Institute of Business Science (GIBS), University of Pretoria. It has not been submitted before for any degree or examination in any other institution. Furthermore, I declare that I have obtained the necessary authorisation and consent to carry out this research.

**Doctor Motswadire**

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**Chapter 1: Introduction to Research Problem**

## 1.1 Introduction

Several studies (Petersen, 2004; Brown and Trevino, 2006; Mullen, Kelloway, & Teed, 2011; Barling et al., 2002 in Chen & Chen, 2013; Xu, et al., 2014; Giles, 2016; etc.) have singled out leadership as prerequisite for driving behaviour and performance in organisations. Building on this general understanding, it suggests that effective leaders will demonstrate certain attributes. Subsequently, in order to succeed, these leaders must be able to implant those attributes to their followers.

It is the intention of this research project to explore and present a typology of such leadership traits that are critical for promoting a sustainable safety improvement in the mining industry within the South African context. Typology is a conceptual framework in which phenomena are classified in terms of characteristics that they have in common with other phenomena (Mouton, 2002, p. 195). The purpose of a typology is not to create an exhaustive classificatory scheme but to find something in the research material that is worthy of classification and to provide some of the categories (Richardson, 1990, p. 50).

Within the mining sector, safety is a legal imperative and critical element; with a combination of various considerations such as controls, systems, culture, employee behaviours seen as vital determinants of safety performance. A study by Pather (2014) found that organisations made many changes to the way workplace injuries are viewed by introducing controls such as safety management systems, risk management systems and human behavior systems in an attempt to reduce the number of workplace injuries. However, as essential as these interventions are, it seems as if they are no assurance of improved safety performance.

Although the culture of safety has been recounted by many and various mines over the years, injuries and fatalities still occur at an unacceptable rate. With this aspirational objective in mind, this study attempts to provide an answer to what leadership is required to encourage this culture.

Safety policy may or may not be important, depending on the worker's perception of whether what management has written is in fact what happens each day (Petersen, 2004). Very often in the mining sector, policies are written by managers but the failure rate to implement at the workplace is still frequent. At this backdrop, it seems there is something lacking. Moreover, it appears that there also exists a quandary on what balance of leadership traits are necessary to foster the integration of safety improvements in mining alongside the current and popular systems based interventions in an effective way. There seem to be a leadership gap in the embodiment and ability to lead mineworkers effectively in pursuit of sustainable safety performance fabric.

These systems do require other elements in the organisation to be in place before it can be successful (Pather, 2014). Whilst organisational culture has increasingly come to the fore as an important aspect of safety management (Dunlap, 2011; Huber, 2012; Mullena & Kelloway, 2011; Popovich, 2013; Waldman & Balven, 2015), leadership has been found as a key imperative by various researchers.

Despite this validation, the researcher could not find recent and relevant studies that has established what antecedents of leadership traits are necessary to nurture a positive impact on workplace safety, in particular on mining safety.

In a study conducted into the impediments to improvements to health and safety in the mining industry by the Chamber of Mines of South Africa in Maphalala (2012), it was discovered that the involvement of senior executives and mineworkers were vital to the success of the safety initiative.

### 1.2 Recent safety trends in mining

Safety management has historically been very reactive in the South African mining industry, with measures of improvement only happening after root causes of major incidents have been established (Pyoos, 2008). The study further concluded that the trend in the mining industry is moving towards a more preventative approach. The adoption and implementation of such approaches such as preventative, would require the mine leaders to change their way of working and managing – a paradigm shift in the mindset seem indispensable.

According to the Chamber of Mines of South Africa (2016), there is still a lot more that is required to be done in order to eradicate workplace injuries. The number of workplace injuries and fatalities are still unacceptably high. Therefore, it appears that there is still a lack of necessary ingredients for truly cultivating sustainable safety improvement. This gap exists despite the mining industry having outstripped the experience curve.

“While 2015 saw an overall reduction of 8% in mining fatalities compared to the same period in 2014, we reaffirm our acknowledgment that we cannot rest until every mineworker returns from work unharmed every day” (Chamber of Mines of South Africa, 2016). Such a telling proclamation by the Chamber of Mines of South Africa, is tantamount to issuing an ultimatum to the mining leadership to continually improve their organisations’ safety performance.

It has been widely considered that most accidents have been caused by human error and subsequently, systems have been implemented to manage the risk of the human factor. At this backdrop, one common approach embraced broadly to combat the risk induced by human error crosswise by various industries including mining, is the Behavioural Based Safety system.

The Behavioural Based Safety (Cox & Jones, 2006) approach’s main focus is to identify and eliminate those human elements that are perceived through incident investigations to have added to the safety incident. Tharaldsen and Haukelid (2009) describes the behavioural approach to safety as analytical, objective and data driven approach that focusses on behaviour that could affect safety and is conducted by first line personnel with of goal of changing risky behaviour into safer behaviour thus driving a culture of acceptable behaviour.

The researcher recognises that in the mining industry, safety management have mainly been as a result of tight mine regulations, deep-seated strongly on written rules, systems, processes and command-and-control philosophies to encourage a safety culture and behaviour at the workplace. Thus to encourage compliance, many mine managers often sought to influence by applying coercive power. However, this approach has not been effective and have not yielded the desired outcomes as evidenced by recurring workplace injuries. In fact, in some cases, there is evidence where enforcement applied was coercive, the safety performance also worsened.

To embed a culture of safety in mining requires more than an employee focused approach. It requires the cultivation of a psychological contract (Winter & Jackson, 2006) between the organisation and the mineworker. Following this, it can therefore be argued that for such an improvement to be sustainable, psychological contracts should be grounded on grandiose leadership traits. Therefore, to lead and entrench such a safety DNA within mining organisations, a safety leader must possess the necessary leadership traits to create and embed the culture to fruition.

It appears therefore, to suggest that different leadership traits are desirable in order to transform and drive sustainable improvements in mine safety performance. It is at this backdrop; that this research seeks to establish a mélange of leadership traits that will guide the mining industry when appointing managers as architects of workplace safety. Therefore, the main purpose for this research project is to identify the key leadership traits that are vital for the mine leaders to have in order to cultivate a sustainable safety improvement

### 1.3 Research motivation

This section provides an illuminating perspective of the impetus of this study to the mining industry. The regulatory and economic impacts to business are derived.

#### 1.3.1 Relevance to business

The Mine Health and Safety Act (MHSA), 1996 (Act No. 29 of 1996) as amended, provides for the protection of the health and safety of employees and other persons affected by the South African mining industry and, amongst others, provides for the promotion of a culture of health and safety as well as the enforcement of health and safety measures or legislation (Department of Mineral Resources, 2015).

This legal assertion, denotes occupational health and safety as an imperative strategic aspect of the mining business. At this backdrop, mining organisations are required to embody safety as a value. In the past decade (Figure 1), the mining sector has contributed just over R2.4 trillion to the country's GDP and R2.4 trillion to the country's export earnings, in real money terms (Chamber of Mines of South Africa, 2016).

### 1.3.2 Contribution to the South African economy

According to the Chamber of Mines of South Africa (2015) in 2014, the mining sector accounted for approximately 7.6% of GDP directly. Although this is a downward trend from the industry's peak some decades ago (from 21% contribution to GDP in 1970), the mining industry nevertheless continues to make a valuable contribution to the South African economy, most notably in terms of foreign exchange earnings, employment and economic activity (Chamber of Mines of South Africa, 2016).

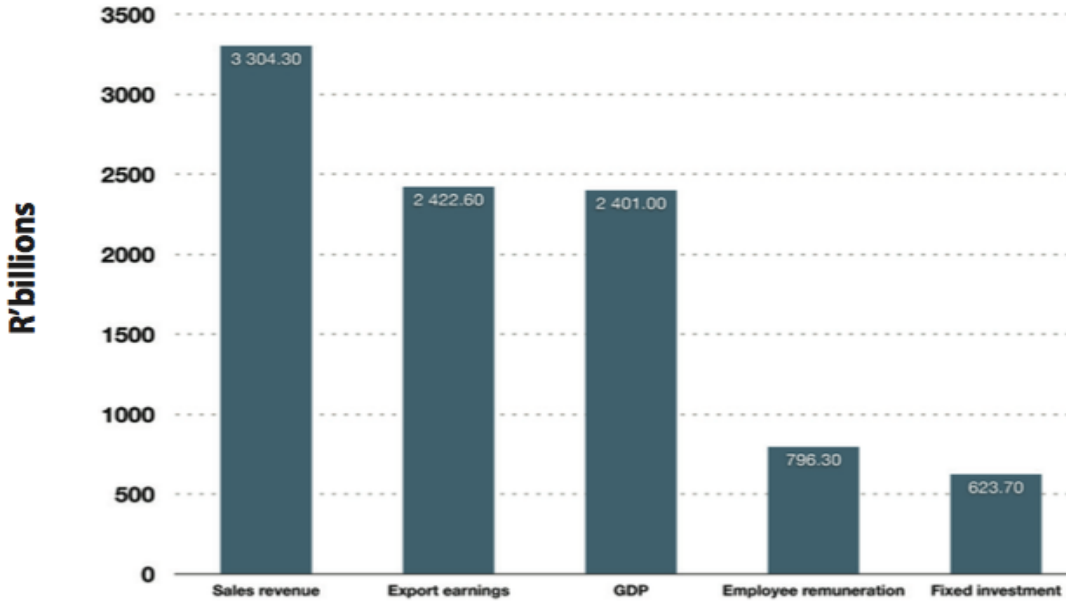


*Figure 1: The contribution of mining to South Africa over the past decade (Chamber of Mines of South Africa, 2015)*

In terms of employment, the sector created about 1.4 million jobs in 2014 and approximately 15 percent to foreign direct investment (Chamber of Mines of South Africa, 2015). These facts and figures indicates clearly, how critical the sustainability of the business of mining is to the South African economy. This economic value add will need to be supported by reduction in workplace injuries.

Without good safety leadership at the mines, the companies will find themselves at logjam with multitudes of key primary stakeholders such as government and trade unions. Subsequently, a

mine leader needs to take a step away from the narrow economic view and take a giant leap towards an expanded stakeholder perspective.

The majority of listed mining resource companies report on safety as part of their sustainable development measures on the triple bottom line (Pyoos, 2008). Good safety performance is therefore critical for these mining companies in terms of sustainability and attraction of future investment (Pyoos, 2008) and this will require a leadership mindset that possess the right balance of leadership traits that embodies a sustainable safety culture.

### 1.3.3 Cost associated with workplace incidents

Workplace injuries have resulted in loss of lives and reduction of productivity, which at the end equates to a loss of revenue for the organisation involved (Pather, 2014). Therefore, if safety in the mining industry is not well managed, it could result in the business of mining failing to attain economic profits and thus leading to a plethora of the invisible hand's eventuality.

In terms of the MHSA, the Department of Minerals Resources (DMR) can issue a "section 54" stoppage instruction to a mine that has failed to comply to the stipulated standards. Section 54 refers to an order by the DMR Inspector of Mines to stop a mine operation due to a safety violation or incident until the safety problem has been addressed.

The mining industry milestones 2015-2024, maintains that every fatality is one too many and that all fatalities will be eliminated by December 2020. This pronouncement has an important implication that every mining company must have a target of zero fatalities. Subsequently; this has become the slogan and hymn for many mining companies. The business implication of this slogan is that safety is a priority and comes first before production. The direct and indirect costs of such an order could be significant.

Rikhardsson and Impgaard (2004) in Pather (2014), breaks up these cost of workplace injuries into these following categories:

#### 1.3.3.1 Workplace incidents direct costs

Certain costs are entrenched and guaranteed with any workplace safety incidents. The most commonly known tangible costs due to workplace safety incidents are:

- Medical costs. In the case where a person needs to be hospitalised or treated.
- Cost of repair to equipment or lost equipment.
- Lost hours. Cost to replace injured employee as well as paying an employee that is not able to deliver productively.
- Loss of revenue if operations need to be stopped. In South Africa, such a stoppage will be referred to as section 54 in terms of the MHSA.

#### 1.3.3.2 Workplace incidents indirect costs

Further to the direct costs associated with the workplace safety incidents are indirect costs, often in form of lost opportunity. This are long-term intangible costs with the below examples being common.

- Increase in insurance premiums due to the claim
- Possible customer dissatisfaction if delivery schedules are not met
- Decreased employee morale leading to decreased productivity
- Costs of systems implemented that have failed to prevent the injury

In addition to the above, the company will incur further administrative costs on the time taken to investigate the incidents. It is important that organisations minimise the number of workplace incidents (Pather, 2014) and ensure uninterrupted production.

### 1.3.4 Safety and culture

Cooper (2001) in Dunlap (2011) argued that when examining a safety culture, safety should be viewed as a value rather than a priority. When safety is identified as a value, it is placed at the core level of being non-negotiable (Dunlap, 2011). Building on this, in studies done by Cooper (2001) and Dunlap (2011) it was argued that priorities change, so the potential exists for situations in which safety is no longer at the top.

Regardless of the environment or level of activity, safety will always be a component of how work is performed (Dunlap, 2011). Many workplace safety programs have been enacted over the years, with more emphasis placed during the purported “silly season” – the period during October to December when accidents appear to rise (Pyoos, 2008). Despite all these interventions, the mine inspectorate report (Department of Mineral Resources, 2014) indicate that there are still unacceptable levels of accidents and fatalities happening at the mines.

Like in many industries, managers are finding that changing the culture is the toughest part of crafting a turnaround (Daft, 2015). Indeed, this affirmation is consistent with the difficulties that are facing mine managers in order to increase their safety performance. One model of safety management will not work in every organisation due to the diversity of how organisations function (Dunlap, 2011).

# Chapter 2: Literature Review

## 1.1 Introduction

This chapter on literature review is premised on the theory coherent with what leadership traits are effective to embody a positive behaviour and high performance culture in organisations. Moreover, the literature review focuses on the construct of leadership in general and the role that leaders play to preserve a fabric of positive organisational outcomes. In order to understand these elements, literature looking into which leadership styles and culture are effective in relation to safety management are reviewed as part of this investigation into what leadership traits are desirable to cultivate sustainable improvements in safety performance of mines.

The main purpose for the review of these leadership areas is to link the current literature and studies on leadership generally; and leadership attributes that will impact followers in a positive way. Subsequently, these elements are related back to the research aim and objectives.

The main focal point for this study is grounded on:

- What traits are associated with effective leadership;
- Which leadership styles are most effectiveness for positive influence on followers;
- Role of a leader in cultivating high performance;
- Safety management.

## 2.1 Leadership

The term leadership denotes different things to different people, making its meaning ambiguous (Petersen, 2004). Certainly, leadership remains one of the most researched and extensively discussed area of organisational behaviour (OB). Leadership studies are an evolving discipline and the concept of leadership will continue to develop (Daft, 2011). Daft (2011) further argues that whilst many leaders still operate from an old paradigm conviction, as illustrated in first column of table 1 below, they are increasingly feeble.

Mullen, Kelloway, & Teed (2011) discovered that inconsistent style of leadership plays a pivotal role as a predictor of safety behaviour. Passive styles of leadership, including laissez-faire leadership, have been associated with negative perceptions of safety climate and, indirectly, increased workplace injuries (Zohar, 2002a in Mullen, Kelloway, & Teed, 2011).

**Table 1: The New Realities of Leadership (Adapted: Daft, 2011)**

| OLD PARADIGM | NEW PARADIGM |
|---|---|
| Stability | Change and crisis management |
| Control | Empowerment |
| Competition | Collaboration |
| Uniformity | Diversity |
| Self-centered | Higher ethical purpose |
| Hero | Humble |

Successful leaders in the twenty-first century will respond to the new reality outlined in the second column of the table (Daft, 2011). This new leadership paradigm, therefore suggest that mine leaders has to transform and possess certain leadership attributes in order to lead the advancement of sustainable improvements in safety at their mines. It is apparent that the traditional way of "*I am the Boss and you will do as I say*" in leading safety is no longer ideal and fruitless.

Leadership has been defined in terms of individual traits, behaviour, influence over others, interaction patterns, role relationships, occupation of an administrative position and perception by others regarding legitimacy of influence (Petersen, 2004). Robbins and Judge (2013, p. 403) defines leadership as "the ability to influence a group toward the achievement of a vision or set of goals".

Daft (2011) provides a similar definition and defines leadership as an influence relationship among leaders and followers who intend real changes and outcomes that reflect their shared purposes.

For the purpose of this research, the context of these definitions by Robbins and Judge (2013, p. 403) and Daft (2011) were embraced as most relevant and fitting to the mining environment as managers are accountable and responsible for driving and improving safety performance. Therefore, in order to manage and improve safety performance in mining, alignment of all employees and those in leadership positions must coincide.

It is impossible to design 100 percent fail safe systems and controls and it is equally trying for managers to be with employees at the workplace all the time. Therefore, in order to cultivate an excellent safety arsenal in mining, a psychological contract must be borne between the leader and the employee. Such a contract nevertheless, is only likely to be realised as many studies suggest, when the mine leader displays attractive leadership attributes.

The main starting point is usually to delineate leadership from management (Crane & Matten, 2010) and it is understood that the two constructs are perceived differently. Notwithstanding this disparities, these constructs will be used interchangeably for the scope of this research. This is because within the mining industry, the manager almost always, is expected to assume the role of a leader.

For safety management to be positive, it must be partnered with an effective leadership technique (Dunlap, 2011). A widespread review of leadership literature reveal that leadership styles differ considerably and that different contexts and situation calls different leadership approaches.

Robbins and Judge (2013) define leadership as the ability to influence a group toward the achievement of a vision or set of goals. The source of this influence may be formal, but a cautionary note by Robbins and Judge (2013) who asserted that just because organisation provides its managers with certain formal rights and power is no certification they will lead effectively, seems to advocate that different organisational situations demands different leadership traits.

Most leaders possess authority because they occupy positions of status relative to their followers, but attractiveness involves much more than authority and status (Brown & Treviño, 2006). Caring leadership helps to establish a more stable and sustainable foundation of influence and power (Sarkus, 2015). This affirmation seems to advocate for a case of that there exists crucial traits

that will make a mine leader successful in managing the progression to improve safety in a sustainable way.

### 2.2 Leadership traits

Trait theories of leadership focus on personal qualities and characteristics (Robbins & Judge, 2013, p. 403). Leadership trait theory is grounded from the perception that individuals are born with definite attributes. Nonetheless, a recent study by Xu, et al., (2014) established that leader's traits tend to advance and evolve over time and are expressed differently under distinctive circumstances. Various studies have produced different definitions of traits that has evolved and found in literature.

The four traits definition found in the study by Xu, et al., (2014) reveals a broad, yet common feature, suggesting that individuals with different attributes are probable to harvest different outcomes when faced with a similar situation.

The four definitions cited are described in the summary table below:

**Table 2: Examples of trait definitions found in literature (Source: Xu, et al., 2014)**

| |
|---|
| 1. An individual's general characteristics including capacities, motives, or patterns of behaviour (Kirkpatick & Locke, 1991). |
| 2. A variety of individual attributes, including aspects of personality, temperament, needs, motives and values (Yukl, 2010, p. 43) |
| 3. Habitual patterns of behaviour, thought, and emotion (Kassin, 2003), which are (i) relatively stable over time, (ii) different among individuals, and (iii) influence behaviour (Garzia, 2011). |
| 4. Relatively stable and coherent integrations of personal characteristics that foster a consistent pattern of leadership performance across a variety of group and organizational situations (Zaccaro et al., 2004). |

These intertwined definitions provide a supreme but common golden thread that provides a pivotal building block for this work. These studies further provide insights that in order to be effective as a leader in managing safety, aspects of behaviour, personal characteristics, motives and leadership styles are likely to yield different mine safety performance. Supported by this backdrop, this study expresses the perspective that the search for antecedents to mine safety improvement originates with the understanding of a top leader or manager's personal traits, values, and idiosyncratic characteristics.

In the work produced by Xu, et al., (2014), the authors asserts that traits are not an event but rather a dynamic process and evolving over time, arguing that these traits can become stronger or weaker, or could change in nature. For example, a leader who used to be very powerful may become gentle later as a result of a major event or some unusual experiences; vice versa, a gentle leader may also change into an autocratic dictator in due time (Xu, et al., 2014). The non stagnation of traits thus have significant implications to the mine leader in managing safety under different conditions.

Another study by Giles (2016) suggests that contextually, there are fundamentally, some capstone leadership traits necessary when leading an organisation. A leader demonstrating high ethical standards conveys a commitment to fairness, instilling confidence that both they and their employees will honor the rules of the game (Giles, 2016) and this will in retrospect, create a safe and trusting environment.

Using these findings as founding spine, it is possible to conclude this is testimony that leadership traits matter in a big way, and as such, should play a decisive stimulus towards sustainable safety performance of the mine. This argument is staunchly congruent and aligned with the topic and the research questions. Giles (2016) also found that in safe environment employees can relax, invoking the brain's higher capacity for social engagement, innovation, creativity, and ambition. The results of Giles' study are represented in Figure 2 below:


**Figure 2: Top 10 leadership competencies, grouped into five themes (Giles, 2016)**

These findings present an important case for a study of what poignant traits of leadership forms antecedents of sustainable safety leadership in mining. At the back of this findings, it is anticipated that during the research, when viewed from a leadership lens, certain leadership traits themes will emerge as main building blocks for a sustainable safety performance in mining. This exploratory research study is envisioned to confirm or contrast this assertion.

In another study premised on a safety literature (Dunlap, 2011) of articles published in Professional Safety from 2000 to 2009, it was established that five themes are common in leadership articles authored by members of the safety, health and the environment (SHE) community: *employee involvement, accountability, developing a safety culture, professional safety responsibility and management engagement*.

Sarkus (2015) identified three critical leadership traits – *credibility*, *fairness* and *caring*. The author describes these three traits as “The Big 3”. Every leader who is credible, fair, and cares about his workers can push their performance to an entirely new level – particularly if three traits are used as their primary base of influence (Sarkus, 2015).

An investigation by Perz (2015) produced ten traits and characteristics that great safety leaders possessed in a broad-spectrum.

This research study established that the leaders who displayed the following traits were effective in managing safety:

**Table 3: Ten traits and characteristics for great safety leaders (Source: Perz, 2015)**

| |
|---|
| Passionate and visible role |
| Plan for improvement |
| Leadership competency |
| Communicate to reach a shared understanding |
| Accountable and responsible |
| Effective metrics |
| Open reporting and shared learning |
| Unrelenting effort |
| Actively care about people |
| Involve the workforce |

Despite this broad study linking the various traits foundations of great safety leaders, few studies have examined the attributes for sustainable safety improvements in mining. This therefore, is an advocacy that a need exists to determine what leadership traits are fundamental for the mine manager to lead a safety performance culture that ensure continuous and sustainable safety improvement.

A common thread appears to emerge between these studies that, in order to achieve the envisioned outcome, there are aspects of leadership relativity that are central. These studies correspondingly seem to reveal that different contexts require different leadership traits. These past studies cited in this work suggests that leadership is vital to incarnate a culture of high safety performance.

At this backdrop, there is a common observation emerging that, to advance safety performance within the mining industry in a sustainable manner, requires leaders to possess a right combination of these qualities. This congruency in the growing research evidence about the evolution of leadership and attributes for specific contexts underpins the importance of understanding what leadership attributes and qualities are an imperative for improving safety in mining. There is therefore, likely a case in point that to a pronounced degree, a mine leader's individual traits can influence workplace safety and influence behaviour.

These studies on leadership attributes indicate the importance of providing an evidence-based approach to sustainable safety improvement in mining. At this premise, this work embodies one such attempt. Drawing holistically, from majority of these parallel studies in the past, there is accumulating evidence showing that leadership traits can fundamentally influence the environment.

### 2.3 Role of a leader

Instead of defining a solitary role, leadership becomes a relational, interactive task aimed at involving all people within the company, all members of teams, departments and areas in the ongoing processes of initiating, defining and realizing projects and the company's objectives (Pless & Maak, 2004, p. 138). This assertion seems to suggest that the "Great Man Theories" (Daft, 2011, p. 19) which assumes the leader's role to be grandiose is no longer relevant. The earliest studies of leadership adopted the belief that leaders (who were always thought of as male) were born with certain heroic leadership traits and natural abilities of power and influence (Daft, 2011, p. 19).

Studies by Dachler (1992); Dachler and Dyllick, (1988) cited in Pless & Maak (2004, p. 138) proclaimed that in the relational role as mentor, coach, moderator, facilitator and cultivator, the leader is no longer the sole author of a particular reality but rather becomes a co-author, and to some extent a lead-author, in a community of equal employees.

Leadership involves influence, it occurs among people, those people intentionally desire significant changes, and the changes reflect purposes shared by leaders and followers and influence means that the relationship among people is not passive (Daft, 2011). Safety

practitioners and researchers have stressed leadership as an important component for reaching a sustainable improvement velocity in safety management.

However, the requirements of attributes of effective leaders that are a fabric to foster sustainable such improvements in safety performance in mining are not yet clearly defined or understood. In particular reference to the mining industry, there seem to exist a knowledge gap in this area. Moreover, the changes required are not dictated by leaders, but reflect purposes that leaders and followers share (Daft, 2011).

The leadership styles adopted by group leaders, on the other hand, also have significant influences on subordinates. A study (Barling et al., 2002 in Chen & Chen, 2013) conducted in the airline industry, concluded that safety specific transformational leadership significantly affects occupational safety. Drawing parallels between the mining industry and airline industry, the two sectors have similar characteristics in that both sectors are stringently regulated with respect to safety management.

It is therefore, possible to make a similar assertion that the leadership style, behaviour, attitudes and attributes of a mine leader will substantially affect the safety performance of that mine.

Perz (2015) postulates a view that the primary reason for a lack of understanding around safety leadership is too much conversation and not enough communication. To communicate a shared understanding, we need to precisely and concretely define safety leadership (Perz, 2015). The people involved in the relationship want substantive changes – leadership involves creating change, not maintaining the status quo.

### 2.4 “Nonsanctioned” informal leadership

Nonsanctioned leadership is the ability to influence followers that arises outside the formal structure of the organisation is often as important as or more important than formal influence (Robbins & Judge, 2013, p. 402). This assertion is another argument put forward to achieve the velocity of sustainable safety leadership in mining. It is a no “one-size-fits-all” matter; but rather it is a combination of key and pertinent leadership traits.

Therefore, to lead a mine to a sustainable safety performance will necessitate a type of a leader that truly personifies a culture of safety as a value.

Research study by Kapp (2012) indicated that those supervisors who are seen as holding a high value for safety and employ these aforementioned principal leadership practices realise extraordinary levels of safety performance from their employees. Strong leadership without this visible safety ethic yields no such levels of safety performance (Kapp, 2012).

### 2.5 Ethical leadership

Whatever approach an organisation might have to managing business ethics, whether it is formal or informal, compliance-based or values-based, minimal or extensive, the role of the organisation's leaders is going to be significant (Crane & Matten, 2010). Observers have long believed that personal traits such as integrity, honesty and trustworthiness would be important to perceptions of leadership effectiveness and research has borne that out (Brown & Treviño, 2006). This finding, firmly supports the pronouncement that certain leadership traits are required to lead sustainable safety improvements in mining.

A study by Brown and Trevino (2006) found that safety ethics plays an essential moderating role in supervisors' abilities as leaders to motivate employees to accept and achieve the goals and expectations for safety (Brown & Treviño, 2006). It thus appears that certain leadership traits could play fundamentally, an important part in the outcome of safety performance of a mine. Subsequently, in order to foster a high performance safety environment, knowledge of what leadership traits are vital will provide the mines with an opportunity to train and employ leaders with the right combination of qualifications, experience and attributes.

Notwithstanding this affirmation, this has not been validated within the South African mining industry, as the researcher could not find any study within the South African context relating to the impact of leadership on safety performance in the mining industry. Numerous research has been undertaken over the years to define different traits of leadership styles.

Moreover, many research has also shown that different leadership styles are likely to produce different outcomes. For example, Taylor & Pattie (2014) found that whilst it is not fully known

whether all employees respond in a particular way or to the same extent, employees with ethical leaders are less likely to engage in deviant or unethical behaviours.

Bandura (1977, 1986) in Brown and Trevino (2006), explained the social learning theory as a conduit for antecedents and outcomes of ethical leadership. Social learning theory (Bandura, 1977, 1986 in Brown & Trevino, 2006) is based on the idea that individuals learn by paying attention to and emulating the attitudes, values and behaviours of attractive and credible models (Brown & Treviño, 2006).

In addition, social learning theory sheds light on why some individual characteristics of the leader and situational influences are related to followers' perceptions of a leader as an ethical leader and it further suggests that, for leaders to be seen as ethical leaders by their followers, they must be attractive and credible role models (Brown & Treviño, 2006).

Building on this, it can be construed that in order to cultivate and influence a sustainable safety culture in mining, relevant leadership traits will be the cornerstone of changing behaviour of mineworkers. Most individuals look outside themselves to other individuals for ethical guidance (Kohlberg, 1969; Treviño, 1986 in Treviño, 2006). This is concept is further explored in Chapter 6.

### 2.6 Responsible leadership

Responsible leadership has emerged as a major theme in management discourse and leaders' orientations to responsible leadership are likely to vary across institutional and cultural contexts (Witt & Stahl, 2015). Citing previous studies (Ghoshal, 2005; Waldman & Galvin, 2008), Witt and Stahl (2015) emphasises that as the world recovers from major economic crisis and a crisis of management ethics, business leaders are under immense scrutiny.

Another study (Waldman & Balven, 2015) looking at a different style of leadership, responsible leadership (RL), found that when specifically considering RL, it is not about whether organisations act responsibly, but about how individuals act and make decisions. Supported by this assertion, there seems to be a need to identify how a leader could play a role to initiate a sustainable improvements of safety performance in mining.

## 2.7 Authentic and Stewardship leadership

Authentic leaders are “leaders who know who they are, know what they believe in and value, and act on those values and believes openly and candidly. Their followers would consider them to be ethical people” (Robbins & Judge, 2013, p. 421). The related construct of authentic leadership in organizations is defined by Luthans and Avolio (2003, p. 243) in Avolio and Gardner (2005, p. 321) “as a process that draws from both positive psychological capacities and a highly developed organizational context, which results in both greater self-awareness and self-regulated positive behaviours on the part of leaders and associates, fostering positive self-development.”

The major attributes of the authentic leaders include genuine awareness and understanding of their own values and beliefs, self-assured, and dependable, with major emphasis on developing the strengths of their followers, widening and enhancing their thinking; and to generate positive and appealing organizational context (Avolio & Gardner, 2005; Gardner, Avolio, Luthans, May, & Walumbwa, 2005 in Zubair & Kamal, 2015). This attributes seem to suggest that leaders who lead from positions of moral influence, not power and who are very follower-oriented (Daft, 2015) are likely to be effective.

Figure 3 demonstrates the “Authentic leadership conceptual model proposed by Lloyd-Walker and Walker (2011) explored within the project management context. This model highlights the characteristics of authentic leadership and how it could be used to manage projects. In many of the mines, safety campaigns are a well-known and common occurrence. Such campaigns are typically large and once off events carried out in project format.

It would therefore, seem as though that in order to run this campaigns successfully, the mine manager leading such campaigns must be have the attributes of an Authentic Leader as exhibited in figure 3 below.

Whilst the work was premised on the project management, the study is very relevant for adaptation into the safety context in mining. This study attempts to ascertain this argument.

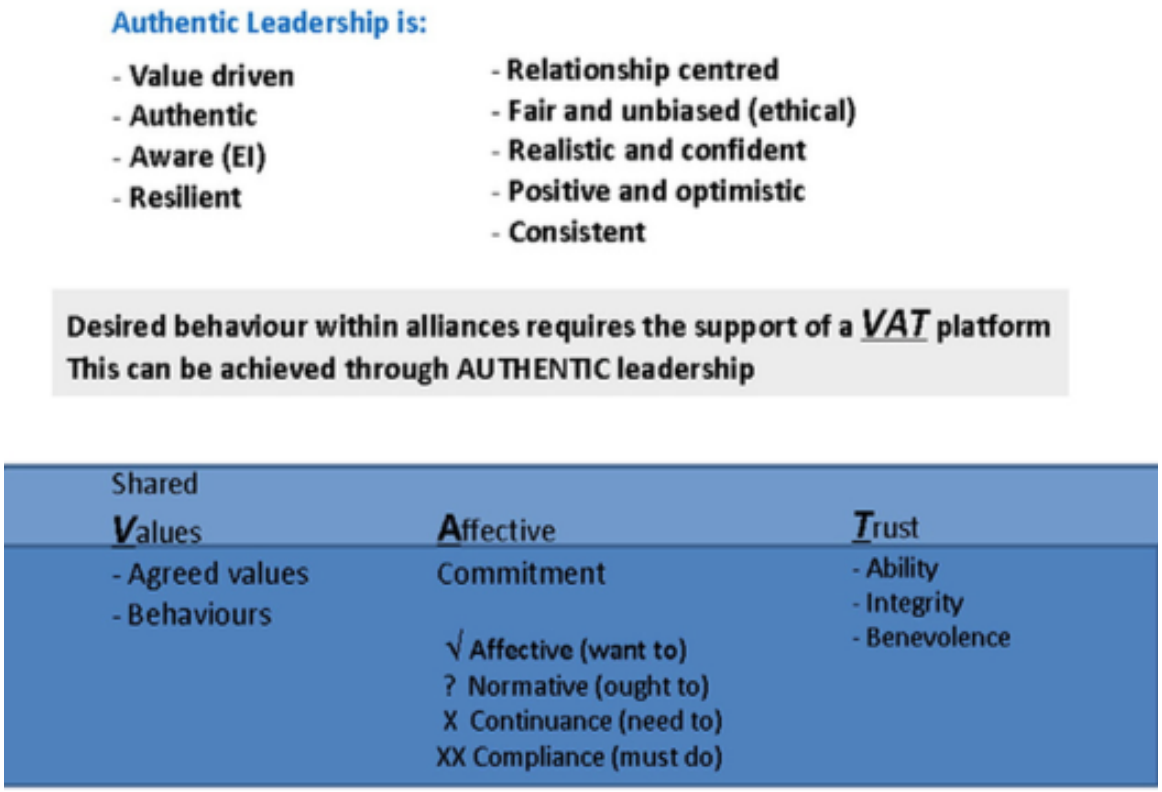


**Figure 3: Authentic leadership conceptual model (Source: Lloyd-Walker & Walker, 2011)**

Ratings of Authentic Leadership have been shown to positively relate to a broad range of vital business factors, for example organisational climate and commitment, communication and knowledge sharing, job-satisfaction and work engagement, even individual, team and overall company performance and productivity (Fusco, O'Riordan, & Palmer, 2015). This attributes are essential in identifying the mine leaders who can be adept in the role of a safety manager.

Many researchers, (Walumbwa, Hartnell & Christensen, 2011; Wong, Laschnger & Cummings 2010; Jensen & Luthans, 2006; Hmielski, Cole & Baron, 2011 in Fusco, O'Riordan, & Palmer, 2015) have investigated various outcomes of the construct of Authentic Leadership in different contexts as outlined in table 4 below.

**Table 4: Authentic Leadership outcome research (Adapted: Fusco, O'Riordan, & Palmer, 2015)**

| Author | Focus area of research |
|---|---|
| Clapp-Smith, Vogelgesang & Avey (2009) | Trust in leadership |
| Wong & Cummings (2009) | Trust in leadership |
| Walumbwa, Hartnell & Christensen (2011) | Communication climate and knowledge sharing |
| Jensen & Luthans (2006) | Follower job-satisfaction and organisational commitment |
| Giallonardo, Wong & Iwasiw (2010) | Follower citizenship and work engagement |
| Wong, Laschnger & Cummings (2010) | Follower citizenship and work engagement |
| Wong & Cummings (2009) | Follower job performance |
| Walumbwa, Luthans, Avey & Oke (2011b) | Group creativity |
| Hannah, Walumbwa & Fry (2011) | Team productivity |
| Toor & Ofori (2009) | Psychological well-being |
| Hmieleski, Cole & Baron (2011) | Overall company performance |

Amalgamation of above studies seem to demonstrate that Authentic Leadership theory embodies the characteristics and attributes that are necessary for effective outcome. Moreover, the Authentic Leadership style seem to call for the virtues of humility, trust, empathy, honesty, kindness and respect to others. Therefore, the road to understanding what attributes of leadership are vital in managing safety improvements successfully at the mines seems to be particularly such one compelling approach.

Daft (2015) contends that leaders who embodies stewardship philosophy are sincerely concerned about their followers and want assist them to grow, develop and achieve both personal

organisational goals. Standing of his theory, Daft (2015) developed the guidelines for stewardship leadership orientation as outlined in figure 3 underneath.

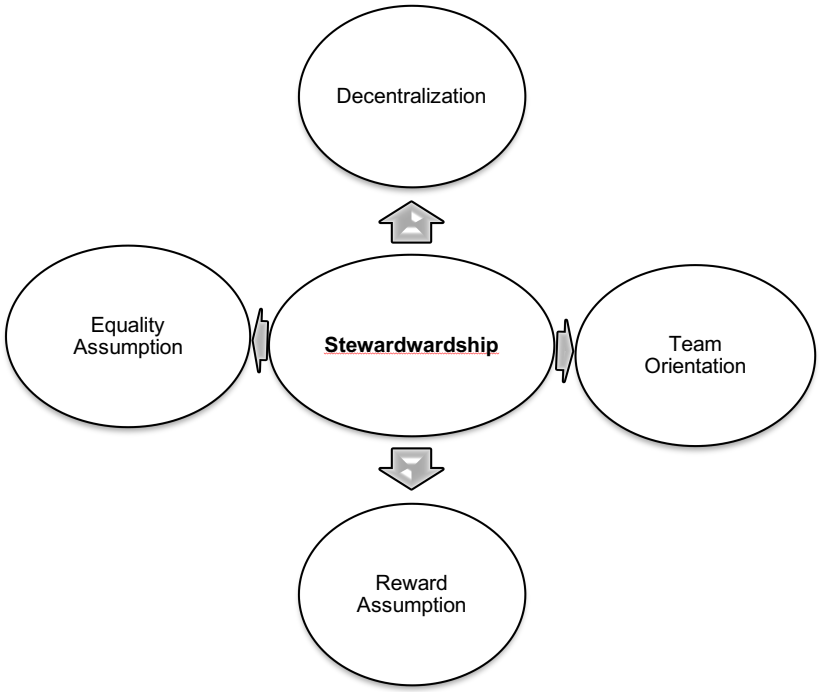


**Figure 4: Guidelines to effective stewardship (Adapted: Daft 2015)**

The role of leaders should involve more than just what their people do on the job; they should also be involved in what their employees are becoming as individuals and how the work environment is contributing to this process (Pollard in Hesselbein, Drucker & Goldsmith, 1999) in Beyleveld (2008).

Building on these guidelines, it does appear to be obvious that the traditional and command and control orientation embodied by many leaders in mining, are no longer relevant. At this backdrop, it seems the mining industry has reached an inflection point for a leadership mindset change if sustainable improvements in safety are to be realised.

## 2.8 Culture versus behaviour based safety

Petersen (2004) posits that leadership and culture are the two most important subjects to consider with respect to what must be to realise improvements in mining safety consistently. A study (Witt & Stahl, 2015) concluded that besides aspects of the institutional context, cultural factors are likely to play an important role in determining executives' responsibility orientations. The above proclamation supports the research topic extensively. Because cultural factors are likely to influence a leader's behaviour and attributes, it is principal to study and understand leadership traits that can provide sustainable safety improvements in mining. This research is designed to attempt to address this requisite.

Previous research on factors affecting safety behaviours has by and large focused separately on either organisational, group or individual factors (Chen & Chen, 2013). Leaders who have certain traits and who display consideration and structuring behaviours do appear to be more effective (Robbins & Judge, 2013). It therefore suggests, that for the mine leader to be effective in managing safety, requires integration of good leadership traits and excellent behavioural characteristics. This assertion reinforces the need for an understanding and establishment of leadership traits that forms the arsenal of excellence in safety performance.

Good leaders build a safety culture, maintain people's trust, control risks and position the organisation for enhanced success (Huber, 2012). Aligned to this view (Huber, 2012), there is an effervescent need to develop shared anticipatory approaches and interventions that are influenced from the top and driven at the shop floor. The mine manager is thus ultimately responsible for providing the leadership, systems and processes for the prevention of fatalities.

## 2.9 Leadership and safety management

Huber (2012) highlighted that courageous safety leadership focuses on people skills, communication, openness and transparency, honesty and integrity. He further contends that safety leadership is about empowering people to speak up when things are not right as well as accepting responsibility. This view, affirms that the current focus on, formal power, command and control, systems and processes alone are not adequate to nurture an effective safety management framework.

Integration of these interventions with the right leadership is critical to manage mine safety in a sustainable fashion. This argument is particularly imperative to this research project. Inability to understand what leadership traits are necessary to imbue high safety performance could result in managers resorting to the current and common industry coercive power use to enforce safety.

Pyoos (2008) found that safety management has historically been very reactive in the South African mining industry, with measures of improvement only happening after root causes of major incidents have been established. However, the MHSA and the safety milestones set by the Department of Mineral Resources (DMR) calls for a more proactive approach towards as safety management. Safety is about much more than just avoiding the injury; it is a strategic imperative for the mining company.

Work conducted by Popovich (2013) seem to echo this assertion. The work advocates that the marriage of safety and communications technology to everyday production, the out-sized investments that companies are making to ensure that safe mines are productive mines and finally the emphasis on safety improvements not just as an end result but as a beginning objective. At the backdrop of these studies, it seems possible to map within the context of mining, the critical leadership traits for sustainable safety performance.

Whilst some work has been done in various industries on the role of culture in managing safety (Pyoos, 2008), there is still, no substantive research that has been undertaken to align and identify how leadership attributes can be effectively used as a conduit for sustainable safety management in the mining industry.

True leadership involves management and knowledge in the field, certain traits of character and temperament – role model assets, and hard work with vision (Cismas, Dona, & Andreiasu, 2016). Furthermore, effective leaders prove extensive life experience and the ability to focus their teams' interests away from conflict and towards results, providing progress opportunities as well as constructive approaches (Cismas, Dona, & Andreiasu, 2016). In order to cultivate safety improvement, mine managers must therefore build, enhance and construct their character to improve their leadership capabilities if they are to be effective in their roles to inspire and persuade subordinates to a culture of sustainable safety improvement.

Building on this, there seem to be a suggestion that the implications for the mine to provide leadership training and persuasive communication skills amongst other qualities. Indeed, the

need for effective and responsible leadership is acknowledged in various studies across other industries as an imperative but very little work, if any, can be found for the mining industry. The basis for this study is aimed to contribute to this gap.

### 2.10 Power basis

Power refers to a capacity that A has to influence the behavior of B so B acts in accordance with A's wishes (Robbins & Judge, 2013, p. 446). Robbins and Judge (2013) further argues that power and leadership constructs are closely intertwined. Mine leaders use power as a means to cultivate safe behaviour at their mines. This is at the backdrop of the fact that, from a legal and safety premise, the mining industry is tightly controlled. Mine leaders who occupy certain roles are legally appointed in terms of the sections of the MHSA, making them personally legally liable and accountable for the safety of their mine operations and that of their workers.

Under the MHSA the legal appointments, should it be proven that a mine leader failed in terms of the act, he/she could be sentenced to prison for years, fined or both, depending on how severity and the circumstances of the safety incident. Regardless of this formal legitimate power, fatalities still do occur year in and year out at the mines. Legitimate power is the power that a person receives as result their position in the formal hierarchy of an organisation (Robbins & Judge, 2013).

It does therefore emerge that as the leader develops and derives the effective leadership traits of attaining mine safety velocity, they should also use their power effectively to influence downward the mineworkers.

### 2.11 Conclusion

It is evident from the literature review that leaders have an impact to influence followers' behaviour, organisational culture. Majority of the studies in the literature review, affirms that some leadership attributes are likely to be effective in certain situations. Subsequently, this research

study is valid to address what leadership traits are effective to embody a consistent improvement in safety performance of the mines.

The reviewed literature indicates that a leadership gap exists in the study of antecedents attributes of sustainable safety improvement in mining. With this gap in mind, the ultimate purpose for the research is to identify key leadership traits that are vital for the mine leaders to cultivate improved safety performance in a sustainable fashion. Moreover, with this understanding, it is the intent of this research to establish how mining companies could then use this learning to develop leadership with such attributes.

## Chapter 3: Research Questions

This exploratory study, aims to develop a typology that will integrate the current safety management systems and processes with the observed critical leadership traits that a mine leader must possess to impact positively on the organisation's sustainable safety performance. This investigation is premised on the assumption that leaders shape the organisations culture, strategy and operational constraints and priorities.

In addition, entrenched in this work is the assumption that leader choices for the mining company mirror leader personality and values. The study also aims to explore and juxtapose the power bases that are crucial to influence a culture that will truly cultivate a sustainable improvement of safety performance in mining.

Drawing from the cited literature, this research is undertaken to contribute further to literature and business by attempting to provide answers to the following two main questions:

### Research Question 1

**What are the most critical, commanding and effective leadership traits required to leverage the processes and systems for sustainable safety improvement in the mining industry?**

### Research Question 2

**What leadership power base is most critical to inspire the workers in a positive way to work towards the achievement of a zero fatalities milestone?**

# Chapter 4: Research Methodology

This chapter discusses the approach assumed to undertake this research study. The chapter further outlines why the study was undertaken using this approach. Emphasis is placed on the design of research instrument used, measurement, unit of analysis, population size, peer debriefing method used for validation, the sample universe as well as the sampling method used. The aim for the explanation of the outline for this research project will provide details of how data was collected and the akin process of analysis.

In concluding this chapter, commentary is made on the inherent limitations of this research project.

## 4.1 Research design

In order to better understand the leadership attributes that are key drivers for the improvement of safety performance in mining, an exploratory qualitative research was conducted. A qualitative format was selected in order to afford the researcher an opportunity to interact with the participants at depth to gain broader insights on the leadership traits that are antecedents to a high performance in safety.

Qualitative research is ideal for exploring a topic which can then inform quantitative research studies in future. Therefore, this qualitative approach be used to explore the relationship between leadership traits and safety performance indicators. As no evidence of such research on leadership traits within the mining industry in South Africa could be found, a exploratory qualitative research has therefore been selected for this study.

The study is two-pronged. Firstly, a poorly performing mining company in safety was identified through purposive sampling. The researcher chose this data collection method to actively identify the mine that have experienced multiple fatalities and struggled with safety in the last five years to help answer and meet the stated research questions' objective. Subsequent to identification of the relevant mine, face-to-face structured interviews was conducted with seven employees – one

employee across each level of the mine's hierarchy. The samples composition is discussed briefly in the sampling section below.

Secondly, a leader from a mine that have consistently improved its safety performance over the last decade was identified and interviewed. This leader was used for the purpose of peer debriefing. The premise and construct of peer debriefing mechanism is outlined in the next section.

### 4.1.1 Peer debriefing

Peer debriefing (McMillan & Shumacher, 2001) supports the credibility of the data in qualitative research and provides a means toward the establishment of the overall trustworthiness (Lincoln & Guba, 1985 in Spall, 1998) of the findings. Peer debriefing contributes to confirming that the findings and the interpretations are worthy, honest, and believable (Spall, 1998). At this backdrop, a senior mine executive was identified from a mining company that has consistently improved its safety performance in the last five years to a decade.

The selected leader for peer debriefing, boast over 25 years working experience in mining business and is regarded as a strategist and an expert in safety management within the mining industry. This leader, was used for the purpose of peer debriefing to test and validate the findings from the research respondents.

Similarly, a face-to-face interview was conducted with this leader. Accordingly, on the basis of the purpose of peer debriefing, it asserts what leadership traits are being applied by the successful mining organisation to accomplish leadership velocity. Furthermore, the peer was used to test the result of the study and similarly, was used to enhance the interpretation of the findings. It was expected that the peer would provide the necessary insight into the theme and how they applied it.

By obtaining the views from the two different perspectives – poorly performing mine leadership in terms of safety contrasted to the leadership of the best performing mining company, the researcher believes that a solid understanding of what leadership attributes are critical to be developed in order to foster a sustainable safety performance can be created.

### 4.2 Universe

Qualitative studies demands for critically thinking about the parameters of the population of the study's interest (Silverman, 2000). Saunders and Lewis (2012) describe a sampling universe as the complete list of all members of the total population. The sampling universe for this study will be all the mines within the South African mining sector that have improved their safety performance or worsened in the last five to ten years. This universe was expected to provide the critical insights of what attributes, from a leadership perspective are essential for ensuring sustainable improvement in safety performance.

### 4.3 Sampling

A sample is a subset of data values drawn from a population (Wegner, 2012) and sampling refers to selecting measured object, counted or observed with respect to and taken from the larger population (ibid.). Successful and poorly performing mining companies in safety was identified through purposive sampling (Saunders & Lewis, 2012). The method of purposive sampling facilitates the expansion of knowledge as the researcher selected the subjects with a purposeful consideration that they will add to knowledge (Bogdan & Biklen, 2003).

This data collection method was selected to actively identify the best positioned mining company to help answer the two aforementioned research questions. The sample included participants at the levels of Vice President, Mine Manager, Production Manager, Safety Officer, Mine Overseer, Union Shop Steward and shop-floor employee.

### 4.4 Unit of analysis

Wegner (2012) defines the unit of analysis as the leading object being measured, counted or observed with respect to random variable under study. In this qualitative study, the unit of analysis is the leader or manager of a mine within his / her organisation's context. At this backdrop, this individual's perceived leadership attributes was investigated and analysed through structured interviews to identity the key traits imperative to sustainably cultivate safety improved of a mine.

### 4.5 Measurement

This study is a qualitative research and incorporates structured-interview with pre-set questions. Structured interview involves collecting data using a questionnaire in which each person is asked the same set of questions in the same order by an interviewer who records the responses (Saunders & Lewis, 2012). Whilst Zikmund (2000) in Maphalala (2012) cautions against the approach that it imposes a limit on allowable responses, for the context of this study it is the best placed data collection format as variation of questions could introduce interviewer bias.

The interviews conducted was face-to-face and conducted one at a time, separately. Each interview took between 45 minutes and 70 minutes. Purposefully, the questions asked to participants were custom-made to match the objectives of this study of determining the leadership traits that are critical for sustainable safety leadership in mining. In addition to notes taken, audio recordings were also made. Nevertheless, where it became clear that a mine employee felt awkward with being recorded, only notes was taken.

This was to ensure that sampled participants provide unbiased responses, speaking freely, openly and candidly. In conjunction with ethical considerations, care was taken to protect the participants and this ethical consideration is briefly discussed in ensuing sections below.

### 4.6 Analysis of data

Saunders and Lewis (2012) broadly discusses data analysis as understanding, interpretation and explanation of the collected data. The raw data from each of the interviews was analysed to determine the emerging common themes. To enable this, the process followed was to analyse the interviewees' responses to exactly the same questions. This interviewees answers were compared and contrasted as the themes surfaced. The analysis of result was derived using the Riessman (1993) qualitative narrative analysis. The mechanism of this model are described in Chapter 6 under theme anlysis section.

In addition, Microsoft excel software was used to determine the frequency of certain words and repetitions. This was important in assisting the researcher to comprehend the common words or words with similar meaning by the respondents.

### 4.7 Ethical consideration

The underlying rationale for the ethical consideration was to preserve and respect the rights, freedom and well-being of all people (Gordon Institute of Business Science, 2016). Mindful of the green pages' requirements (Gordon Institute of Business Science, 2016), uncompromising ethical consideration was central to this work. All participant was required to affirm their participation as prescribed by the university and this was done by completing the informed consent form. An example of the informed consent form can be seen in Annexure 2.

#### 4.7.1 Recording and storage of data

Were applicable, audio records of interviews were made and these will be made stored and made available as per the university research guidelines found in green pages (Gordon Institute of Business Science , 2016). This will be locked up in a safe place for the required period and will only be produced if required and called to do so by the university.

Furthermore, the notes made and transcripts made were submitted with this research report in an electronic format using a flash disk.

#### 4.7.2 Anonymity

Anonymity and confidentiality of participants is guaranteed by not naming any research participant in this study. In ensuring anonymity, the researcher does the following:

- Inform and affirm participants of voluntary nature of their participation in the research and that they can withdraw any time (McMillan & Shumacher, 2001) during interview process
- Respect the right of participants to remain anonymous
- Ensure that participants are not harmed or exploited in any manner
- Assure the participants that their rights will be maintained and protected
- Inform all participants of any data gathering device that will be used
- Respect the right of participants to reject the use of data recording devices
- Adhere to confidentiality obligations
- Ensure secure storage of information collected

### 4.8 Research Limitations

The following limitations associated with this research project have been identified:

- **Time constraint:** Limited time of the study and the availability of the chosen samples. Subsequently the time constrained has not allowed for testing of the identified poignant leadership traits with other successful mining companies.

- **Heterogeneity:** The South African mining industry is very broad and include various commodities. Whilst this study is expected to provide valuable insights on the role and exemplary traits of leadership to improve mine safety performance, the constriction of the research to only one best performer and one worse performer has potential to constrain the sample's variability. Sample consisting of sufficiently diverse characteristics will provide maximum variation possible in the data collected (Saunders & Lewis, 2012).

- **Confirmation bias:** Samples emanated from only the coal commodity and there is a probability that culture and context across other commodities such as Gold, Platinum, Chromite, Iron ore, etc., for example could be significantly different to the eventual chosen commodity representatives.

- It is the researcher's knowledge that both the dynamics and culture make-up of mining operations differs vastly across various commodities. As a result, there is an implication that the outcome may be skewed towards negatively or positively due to non-randomness and / or homogeneity.

- It is acknowledged that there are many other factors outside of leadership that can affect the sustainable safety performance in mining. For the purpose of this research project, these elements were not considered at length as the focus was placed on the leader to use his / her traits as driver and enabler of improvement in the mine's safety performance.

### 4.9 Conclusion

In-depth interviews were conducted with employees at different levels at a large international coal mine in South Africa. The wide nature of the sample population provided great insights to the research topic and was able to provide answers to the research questions. The interviews execution approach was two-pronged. First, data was collected through interview of employees and second, an industry subject matter expert, was interviewed for peer debriefing.

The main purpose for the peer debriefing process was to validate the results and the data collected. The result obtained through the process are presented and discussed below in chapter 5 and chapter 6 respectively.

# Chapter 5: Research Results

## 5.1 Introduction

This chapter discusses the research results. The data received from the in-depth structured interviews based on the categories of the interviews are presented. These structured questions were formulated to fit in with this research topic's objective. In order to understand the leadership traits that are antecedent for nourishing safety improvements in mining, leadership should not be seen in isolation. In attempting to make sense of the extent that leadership can be effective, the research interviews were integrated into the following six broad categories as defined by the researcher and study leader based on the set of questions identified:

- Safety culture;
- Leadership approach;
- Processes and procedures employed;
- Power basis displayed by mine managers;
- Perception of management behaviour towards safety;
- Investment efforts to enhance safety education and improvements.

This approach to the interviews provided useful and informative answers to what the interviewee believed was working well when integrating systems and what leadership attributes where believed to be effective within these frameworks in promoting a culture of improvements in safety performance.

## 5.2 Demographics

This section presents the demographics of the sampled employees of a large international coal mine operating in South Africa. The interviewees were taken from different levels including senior executive at the Vice President level, spiralling down to the shop floor level. The respondents have gathered a minimum of seven years to a maximum of 25 years' working experience within the mining sector.

The participants' age in the sample varied from 28 years to 55 years. The sample comprised of four black males, two white males and one black female. The respondents have collectively accumulated over 114 years of mining industry experience. This diverse nature of respondents ensured that there was no skewness into the data collected and provided a wide-ranging perspective to the research questions.

A summary of the respondents' demographics makeup is presented in table 5 below.

**Table 5: A summary of demographic makeup of the interviewees**

| Demographics | Experience (years) | Current Position | Race and Gender |
|---|---|---|---|
| Interviewee 1 | 11 | Execution Superintendent | Black Male |
| Interviewee 2 | 12 | Project Manager | Black Female |
| Interviewee 3 | 8 | Planning and Development | White Male |
| Interviewee 4 | 10 | Production Manager | Black Male |
| Interviewee 5 | 37 | Union Rep | Black Male |
| Interviewee 6 | 11 | Trade Union Representative | Black Male |
| Interviewee 7 | 25 | Vice President - Health, Safety, Environment and Security | White Male |
| **Combined years of experience in mining** | **114** | | |

### 5.3 Research instrument and raw data

The preceding Chapter 4 outlined how this data was collected. In depth, open-ended structured interview questions were carefully designed to meet the research project objectives. The nature of the interview questions allowed for probing when the interviewee provided substantively inexplicit response.

To ensure that the company identity and respondents' names were not compromised, the names of the respondents and the company identity are not mentioned in this report and where the

respondent mentioned the name of the company, this was removed and the company was given a pseudo name.

For the purpose of this study the company investigated will be given a fictitious name '*New SafeCoal Colliery*'. Furthermore, due to the fact that the mine has gone through a demerger in recent past, the previous name of the mine prior this change will be branded '*Old SafeCoal Colliery*".

The result obtained from the interviews are presented and remarks are provided for each category. At the backdrop of the understanding that, this research project was founded to determine what leadership traits are crucial for sustainable improvements of safety performance in mining; the questions were designed to provide elaborative responses focusing on the current reality pertaining to safety culture, leadership, systems and the espoused future reality that will embody sustainable safety improvement. As a result, the research questionnaire found in Annexure 1 was set up to deal with emerging themes in these categories.

The result obtained from the interviews questions are presented as per the stipulated categories in the next section.

### 5.4 Research results

The responses to questions relating to the categories set out in the interview schedule found in Annexure 2 are presented. Due to extensive data contained in the interview transcripts, it was impossible to reproduce the transcripts in their completeness. Therefore, quotes of the verbatim text that were found to be enlightening; and demonstrated insights that copiously address the research topic and questions are derived.

While the interviewees express their views differently on similar questions, they offered congruent responses in many of the questions during interviews. At this backdrop, those extracts that describe the emerging themes best; and provided a narrative of the emerging themes were selected. The themes that emerged are discussed in Chapter 6 and these themes were used to develop the framework presented in Chapter 7.

From a technical lens, where text have been omitted, the use of three dots (…,) followed by a comma was used.

### 5.4.1 Safety culture

Under this category, the interviewees were asked to respond to five questions that relates to the mine safety culture. In addition, the interviewees were asked to describe what imperatives they believed were important to indoctrinate a culture of safety at their mine.

An answer from one respondent (Interviewee 3) said:

> "Look, for me; and that's always what I believe is key is safety like production like anything for me **it really starts with the small things**. There's a book; if you wanna go read it if you haven't yet, "the tipping point" – very good book, so do yourself a favour. It also speaks about various, very small things throughout history that fuelled big changes and I personally think from a safety perspective it is really the small things. If I can give an example, if you do a walkabout in the plant and you for example see a hosepipe or poor housekeeping, so your norm would probably be to walk past it. I think from management perspective, if you really focus on those type of small things and you stop right there and then and **call the whole team together** and that's probably the second point – **be inclusive** don't follow just hierarchy straight down, we're all **one team** although we have different roles. So call the **whole team and speak to them** what you saw in that moment – how we're going to correct it, find out if can do something else. And I believe if we focus only on the small things, the mindset of the people will be of a similar nature to focus on small things. And obviously following from the **care** strategy, if you have an all **inclusive work team** where you involve every body, you can **create an environment where everybody is involved**".

Dealing with the question of their mine's safety culture, the interviewees agreed that safety culture at the mines have been promoted over many years at their mine and across the general mining industry at large; yet this has not been fruitful. While a culture of safety has apparently been sung by the mine managers, there appears a general viewpoint that, **not all of them sings from the same hymn sheet.**

One respondent (Interviewee 2) offered the following response:

> "I would say obviously the managers they have contributed driving the culture how the culture is currently. I think if you were to look at the mining industry back in the days versus what it is today, the culture of safety has been preached for a long time now, obviously with the incidents, the fatalities that we have seen we cannot just really say that everybody has embraced the safety culture. At the same time if you look at this particular mine we looking at, the leaders have really contributed a lot in making sure that they drive that culture because without the **leader being the example** trying to also **give the guys a vision** in terms of that this is what we aspire to achieve then we won't be able to actually **achieve the outcome** that we desire.

For something that is proclaimed to be important to the company, it should be top of mind to its employees, on the list of the top important issues in mining and even to them personally (Maphalala, 2012, p. 40). For safety to be top of mind is also indicative of the entrenchment of such culture within the organisation (Maphalala, 2012, p. 40).

> "Our culture of safety is zero tolerance, that's our culture and how we drive it we do everything so that it's driven from the bottom. Yes, the leadership will be a kind of a policeman to check if everything is done but we let everyone to be the policeman for himself and for his colleagues, you know the **whole brother's keeper** is still there".

Another reiterated the above and commented:

> "In our case we've got a stop culture, stop activity culture, if you doing something wrong we stop you, we will coach you right on the spot and we will record that, it will go onto the system and we will record it. If it was a major thing, we record it as a PL4 (potential level 4 – the major safety risk which could result into a fatal accident); and if it is at a PL4 level then we will form a formal investigation, either be a team of an Engineer, the Section Manager and that employee, the environmental people and safety people together will investigate the occurrence of that misconduct as to what actually drove it".

Interviewee 6 described succinctly and claimed that the culture of safety at the mine is safety first, production last and commented that the employees themselves are drivers of this culture.
The respondents' assented that their mine safety performance was meagre. Nevertheless, it is surprising to note that on average they gave a grade of 6 out 10 when requested to rate safety performance of their mine. The expectation would be, because of the recent fatalities experienced in the last five years, the rating would not exceed a rating of 5.

When asked to explain what has led to their mine's current safety performance, four expressed a view that the recent **company changes** of their mine's ownership contributed to the poor safety performance. The interviewees seem to believe that the **organisational change** that happened was at the centre of many of the safety incidents that occurred. The general believe is that focus on safety was neglected and **change process was not led effectively**. Some stated that most of the incidents could have been avoided.

Excerpts below of their narrative pointing to the effects of the mine change provides further illumination.

> "Look, because we've just **moved away from a different business**, that culture would be, we were very strong on zero harm, we had a zero harm culture, so, but there is a carrier on that because that was very much systems driven so **it was almost that people believed the system will keep you safe** and there was a rule, and a policy, and a procedure, and a standard for everything which, which to a degree drives a behavior that when someone is confronted with a problem. The first thing they think of is what does the standard say as opposed to what problem is this? Is this a simple problem with an answer? Is it a complex problem? Is it a dilemma? You know where I need to engage different people or seek specialist advise so what we are **working towards is a culture where inclusive, where, you know, you speak up, yes, and where our value of care is at the centre** with the decision that we make. Look, but we are not there yet. In order to get there, we need to be a bit more relaxed and leaders need to allow people to fail and we've got the saying "**fail fast and fail forward**", it's a **learning from mistake** which I don't think we did all that well in the company we split from; although that company is also on a journey of their own towards culture improvement and change".

Interviewee 1 - “There could be perhaps quite a lot because the company has gone through a lot recently, **the change from ‘*Old SafeCoal Colliery’* to ‘*New SafeCoal Colliery’*** (pseudo names given to protect identity of the mine), the **change in the culture**, **the change in identity**, **the change in the structures**, so all of those, you know if you were to dig deep contributes to how people perceive and behave at the workplace. Some people wouldn’t be well and won’t gel well with the structure or will take time to change to the new structures and also the new culture. **It is just a question of how one manages change”.**

Interviewee 7 - “So the context is that we recently **broken away from another company and the parent company is very systems driven**. So focus was conscious stream to create a more entrepreneurial culture. I think one of the biggest impacts on our safety performance now that has not been good through the last year has been **the market conditions**. Well, it's not the market, that's a bit of an external control, **it's our response to the market condition**. Because we've had a few businesses that were fighting for survival six months ago, so we **went through retrenchments**, we went through capital cutting, we went through severe cost cutting”. “Now if you think about leadership and what leadership focuses on, that filters through the business but **we were so fixated and focused on cost savings to enable the business to survive** as mining was going through very very tough times and especially some of our commodities that to a degree we did that at the expense of safety. Look the intent, you can speak to any leader that wasn't the intent; our focus is safe operations. In addition to that, what happens to the psyche of people working on your side, so **leadership was focused very transactionally** on affecting the savings but during the period where people have uncertainties, they may be declared redundant, etc. People go through emotional strive and then the whole person, you know this **inclusive workplace**, the whole person is not at work because you worrying about debt, you worrying about that, we didn't do nearly enough, you know...”

It appears that at the time when demerger occurred, the mine leaders fixated on the narrow economic outlook; and neglected the small things that mattered to maintain good safety performance. The impact of the change seems to have been primarily focused at economic level. Some of the respondents strongly believed these fatalities could have been avoided.

> "We first probably need to define what the current safety performance is and obviously what I am saying is only my perspective and opinion. We had a bad year last year with fatalities and injuries and so forth and obviously one is too many; but **we had a couple of ones at various operations that should have been avoided at all costs**, so I would say current performance is really poor from that perspective, and if you ask me – I would say **the whole demerger which happened** you know earlier in recent years and obviously leading to that; because **obviously it was demerger** and then after that we had restructuring. I think that could potentially lead to fatal mistakes and **lack of focus** and so forth. I would say for me **it was the change that took place**".

The current economic challenges in the South African mining environment are seemingly presenting new challenges for mine managers and business – not only in terms of economic performance but on safety performance too. Parallel with that, the country's MHSA and transformation also presents new challenges for mine managers in terms of safety practices and processes in the improvements of safety. The **safety focus seems to have shifted due to the market condition**. One respondent contended that:

> "Yes, so that's partly why our safety performance has not been excellent on the positive side, our business has transitioned. I think from higher level leadership; the strategy is absolutely clear. The language used is very strong on where safety fits in is that safety is a core component of our values, **the value of care is to embody safety** but what we try to focus on or what we are focusing on it's not that, it's not about, if you want people to be safe, why, so if you ask the why what's the end state not the means to end".

To validate the current management attitudes, the interviewees were sked to explain the attitudes and approaches of the mine management as well as what methods were needed to achieve sustainable improvements in their mine's safety performance, three respondents thought that the attitude has to change.

Interviewee 2 believed that the attitude is somewhat changing and commented that:

> "Back then, it was production tons at all costs and now **the attitude has changed** to look at is it safe to do this task safely and there has been a shift over the years".

In a much tougher tone, another respondent (Interviewee 1) claimed:

> "I think in terms of attitude well; the **attitude has to change**. Having been in the mining industry for so many years right, we know where we come from. Even in terms of the country itself, where South Africa comes from, we know how things were done. We know where emphasis was put; and all of those were actually contributing very little to the safety of the entire workforce so most of the sophisticated safety systems were in areas that were kind of affluent areas if I may put it that way. That's where perhaps senior people would get involved and right at the bottom the guy that's having the broom in the plant floor, the guy that drills the phase, the guys that supports the roof, safety then was like if one guy died they would pay that family R5 million or whatever and it's done. So the **attitude then today has to change** because now with the **change in political sphere**, the **change in the knowledge base, the change in the minds**. I guess the leadership in these mines then the attitude is slowly but surely changing by people starting to **realise that, that guy supporting the roof is actually a human being**, he has got a soul, he has got a family, he's got all sorts of things so now the company' mines are slowly putting strategies in place and spending money to protect or to make those environments safely".

The company has recently developed and is implementing a new safety called "*care strategy*" ('*New SafeCoal Colliery*', 2016) …, and this intent, looks to be admirable. One responded proclaimed that: "The safety culture is not where it is supposed to be". At the backdrop of the principles of the "care strategy" the mine's aspirations are stated as follows – to support its people to ('*New SafeCoal Colliery*', 2016):

- become completely involved, every day, in how we run and improve the business;
- bring their true selves to work, speak up and help turn ideas for improvement into reality;
- contribute to the ongoing improvement cycle of designing-out errors, risks and hazards from our workplaces, tools and equipment and processes;

- only perform work when we're confident that the workplace is ready, the correct tools are in place, people with the right skills and experience are available and that there is enough time to complete it.

Under the "care strategy" ('*New SafeCoal Colliery*', 2016) the company wants to transform its business to a culture of care and inclusive workplace.

One respondent (Interviewee 3) stated that he saw leaders as agents of the business; and presented a broader response, giving an integrated perspective about the company's systems that they were actually contributing to that kind of attitude.

> "Look, unfortunately the leadership is the agent of the company so whatever the leadership does reflect the company. So it's a combination. So **the company has to manage the leadership** because the leadership is the agent of the company; so I wouldn't say it was the company or it was the leadership in isolation of the company, it was combined at the time. I think from where we coming from, we know both they **cared less about the safety of the guy who's putting the roof bolts**".

Interviewee 2, pointed to complacency in leading the change process and further juxtaposed it to operational level as equally very critical.

> The other thing could be **complacency**, could be that, you know when a person has done something for so many times then they think they know all the rest and one thing that I have seen that **we haven't been able to manage well is when the conditions change**. Let's say maybe they were working in a particular project, right, they do all their risk assessments, they do everything and then they tick the box; but as soon as the environment or **conditions of that area changes**, the guys don't go back to see now have we introduced new risks, that we need to manage differently. So it's all about also **getting that change management across to people** to understand that **whenever there is a change you need to rebase your assessment** and make sure that you do your assessment"

### 5.4.2 Leadership approach

Due to the nature of this study, this category was the most extensive with ten questions falling in this grouping. The category of questions was derived to specifically address the needs of the research topic. One of the questions put forward to the interviewees was: What will be the ideal manager/leader for cultivating a sustainable safety performance and what type of a leader, and what should this leader look like? What behavior should this leader display?
On this question, one responded stated that:

> "So it will have to be a leader with quite a number of leadership traits I guess. Because number one, you need to be **a person who would not tolerate any deviations to the standards** and to the systems. So **you need to be a harsh leader**, ok, however, at the same time you need to **be a leader that is able to convince the people** so you need to be, not necessarily people's friendly but you need to **be able to communicate** and get the message across and not enforcing it. You need to be a good communicator. You need to **be tough on standards**".

There is an overwhelmingly believe that not all managers are capable to do certain things. Expressing their views on the question whether the respondents believed that some mine are leaders are unquestionably better at managing safety than others, there was unanimous answer, 'yes'.

> "Yes. Some managers are just better because they are there physically and understand why things happen. They think about it, they put procedures in place, **they don't take tolerance or deviation from standards**, they don't indulge it – which makes them good safety drivers. Other managers such as **if people don't tend not to respect you then you're are really an a**s;** if I can say that. Then people won't really care about what you say – it will be more operating out of fear other than the sense of accomplishment you know. And I think that's what makes the other manager better than others.

In an environment such as mining, where the business model and profitability of the the business is premised on high volumes, mine managers are often challenged to meet production targets. Pointing to the ability of handling production pressures, one respondent argued that:

> "I think so. I would say yes and the reason being that others are **capable of handling pressure**, others aren't. Now the pressure in the mining industry is production and it's to satisfy the customer; and so the production pressure pushes some leaders to turn a blind eye towards safety aspects and those would be the leaders who are unable to handle pressure – leaders who have no **capabilities of managing stakeholders or managing up**. Let's put it this way, because the first thing your boss will ask you is production and then follow safety and you hardly go to the board meeting and talk safety first, you talk production and then safety and so on".

When asked what methods they believed are important to achieve mine safety improvements, three argued **employing the right personnel aligned to the company's vision and values** is critical. Whilst this view is generally supported for organisations at large, this pronouncement was made with a firm focus on safety management.

> …, "The other thing that you can also look at is **the type of people you employ** because as much as you are trying to manage, you need to **get people that are in line with what you are trying to achieve**. If you get people that are not safety conscious, don't expect much from them. It's all about the systems and processes that you put in place; they can support you that you don't have any incidents in your working area (Interviewee 4)".

At the core of this category and having dealt with safety culture of the mine and the general attitudes of the mine leaders, the respondents were asked to provide a description of what would be an ideal manager or leader to foster a sustainable safety performance.

Giving an answer to this question, Interviewee 4 give a commentary pronounced that:

> "Um, I think first of all, it will be a transformational or inclusive leader that **respect each and every level** and physically takes the time to speak to them and listen to them rather tell them what to do – leadership listen more than tell. So I think if you have a leader like that, that is **open with the people and honest** and can speak to them and ask for their opinion. Also a leader although **inclusive**, **he doesn't accept deviation from standards** even if that means disciplinary procedures in one form or the another; and I am not saying that the HR way is always the right route. Even if calling in the guy and talking to him about

> it because he must understand that a lot of other people's lives depends on it. So if you can set that culture to make sure that **nobody deviates from the standards**, but again it is also **about listening**. If he deviates, understand why he is doing that instead of just telling him: you deviated and this is the punishment. It's about understanding why he deviated. If a leader is inside into to that you can actually identify why that is happening, then you can take it forward. If it is pure just negligence from that person, that needs to be addressed but if other factors that you don't even know about drives that behaviour, **you need to find the root cause**".

Digging deeper, a question was asked to all to identify their perceived five topmost critical personal attributes critical for managers and leaders to have at their mine for managing safety effectively. Although, the interviewees were asked for top five attributes, most provided more at 6 or 7. Similar answers appeared to emerge in the respondents' narratives.

One respondent (Interviewee 3) stated that:

> "I will call it values for the time – One, **respect**. I think that is vital and obviously you can go and define the word respect. Respect is that we each have our own different schools; we each have **mutual respect**. Two, Honesty. I'm saying that because often times we are dishonest either with ourselves and **we don't identify what we are saying** you know, if it's actually alright and so forth. I think honesty towards individuals, yourself and your team, and put facts on the table and let's address that. Three, I wanna put **care** but I don't know if it links to respect – but care in other words I really **care about the employee** who walks into that gate whether it is a contractor or whatever, it is a **sense of care**. Maybe linking to that is from safety perspective is I would say some form of four, **protectiveness**."

In commenting further, he echoed that:

> "Like for example, if you go and play with a soccer team you have a sense of protecting each and every team mate because they are part of the team and if the leader has that, he will already drive safety a bit better. And linking that to the previous one if you see a person doing something wrong is not only about protecting him, it's about **protecting everyone else**. Five, **inclusiveness and collaboration**. You are sure that you include

and **collaborate changes** with everybody. Six, **effective communication**. That is also vital, and linking to that is not just about communicating what happened, it is about closing that loop and **distributing the learnings**".

The emerging themes are presented in table 5 underneath. These themes have been derived from all the responses of interviewees across dealing with all the categories.

**Table 6: Respondents' descriptive summary of effective leadership traits to embody sustainable improvements in the mines safety performance**

| | |
|---|---|
| Interviewee 1 | Non tolerant to deviation from standards; ability to convince and get the message across; leader can communicate; must have good value system; a person with a vision; care for another human being; values the contribution of another person. |
| Interviewee 2 | Able to communicate; ability to relate people; action oriented; ability to engage people; must be a trustworthy person. |
| Interviewee 3 | Mutual respect; honesty; effective communicator; inclusiveness/collaboration; must be result driven and action oriented; caring; less tolerant to deviations from standards; open and listening more to people. |
| Interviewee 4 | Trustworthy; must have respect; good at communicating; leader must be caring; must be humble; inspiring; tough on standards. |
| Interviewee 5 | Ability to influence others, must have passion (i.e. believe that it is achievable); have good relations at all levels; encourage people to do what is right; caring; teamwork; oneness spirit; communicate well; must be action oriented; must give feedback and recognise job that is well done. |
| Interviewee 6 | Respected leader – not feared; open door culture; good listener; able to provide alternative solutions; lead by example; must have patience. |
| Interviewee 7 | Leader that embodies inclusion; aligned to the values; trustworthiness; must be able to make tough decisions; committed; passionate; must be accountable and responsible; outcome focused. |

Most of the interviewees responded by giving an elaborative explanation on their ideal manager and pronounced that there is a need for a shift in the leadership style – almost suggesting that an inflection point has been reached. Majority of the interviewees argued that the systems based safety management approach was inadequate.

When probed further to elaborate and to specify examples on the delicacy of strong focus on systems to entrench and promote sustainable safety improvements at their mine, unanimously, all pointed to the current fatalities experienced at their mine. Five of them claimed that leadership should improve.

### 5.4.3 Processes and motivation strategies employed

There were two main questions were designed to deal with this category. Asked what processes, motivation strategies or principles are being used by the mine leadership to improve safety at this mine, one respondent noted that:

> "There's quite a number of them. First of all is the visual field leadership. In other words, the walkabout and so forth that is a strong drive for all levels. Even in our department for example one of our KPIs (key performance indicators) will now be for the next year to do certain number of safety visits. Again **it depends on the leader**; but overall the idea is to walk in the production area, identify safety issues and report and if it is major do an investigation. Everybody participates in that".

Most interviewees cited that **safety performance bonus system** was the standard motivation strategy applied across all the mine's operations. In order to achieve the safety critical mass momentum, it appears that leaders needs to have the ability and develop tactics to motivate people in order to lead and guide employees a safety improvement culture at their mine by vehemently sharing his own vision for the organisation in terms of and what the organisation needs to achieve.

> "…, at various levels there are incentives and those are monetary incentives. I think what's

> more effective is just recognition, so typically, recognition comes in where and it goes into the culture of continuous improvement, so when people get an idea or they do something in their area that improves their world, we actually present that and share that with other teams. I believe that of a very effective way of building the culture".

In order to motivate employees towards a common course such as sustainable safety performance of the mine, mine leaders should promote eradication of motivation methods that compromise the mine safety. High levels of production are rewarded through various production target incentives (Pyoos, 2008, p. 11). An example of this is when electricians bridge out safety devices to keep production going (Pyoos, 2008, p. 11). The behaviour is rewarded since the machine is made operational much faster, ensuring continued production (Pyoos, 2008, p. 11).

Nevertheless, such an act leaves the machine with potentially dangerous electrical fault that could have fatal consequences, but because of the perceived reward, the action becomes part of the entrenched culture (Pyoos, 2008).

> "It's **all about how you recognise your employees**, so what we usually do at mass meetings is whenever a guy comes up with a good safety idea that improves safety in the workplace, we sometimes also nominate them for that particular week and they get to share that idea with the entire team and then we just recognise them in front of the team. The other means is obviously via **the bonus** although probably in my head I'm still asking myself whether it's the right measure to really give people incentive for really working safely. The other thing it's about, the one thing that was introduced is around the VCLs (visual coaching leadership) right, trying to **engage the teams** out there and also **recognising the good that they are doing** because a lot of times we just went to the field to look at what the guys are not doing instead of also just commending them for what they're doing well. So I think that will assist in a way in terms of the guys will keep motivated".

When the hygiene factors such as quality of supervision, physical working conditions, pay, company policy, and administration are adequate, mine employees will display a positive behaviour (Robbins & Judge, 2013).

> "…, So **it starts with the leader** himself or herself understanding or being clear in his

head or her head in terms of safety on what are those critical things that they need to put in place. **Having a vision** because we all want to have our employees going home safe without any injury or accidents or property damages; so it's all about **you know what you want to achieve** but you also need to understand where you are in the process and how you going to get there; and you need to **make sure that you communicate clearly** to the guys in terms of these are the steps that will get us to what we actually are aiming at".

In relation to the last question in this category, the respondents highlighted that generally, when procedures are developed an attempt is fostered to have at least one representation on employee level and that employees working in that area are encouraged to take part. One respondent stated that even if the procedure top-down, employees would be consulted for inputs before it can be implemented.

### 5.4.4 Power basis style demonstrated by mine managers

This category deals directly with the research question 2. At the backdrop of this category, the interviewees were asked four principal questions. When asked to describe how their mine management ensures adherence and compliance to the safety rules and standards, five responses were consistent that **recognition and rewards** were common approaches and they claimed this was necessary a motivation strategy. One respondent however, had reservations, and cautioned against this and doubted that this was effective *modus operandi*.

Respondents further highlighted that the mine management were involved in a process where each manager is expected to spend some time on the field talking and **coaching the employees** on safety. This time spent on the field and any safety observations (good or bad) must be logged in the system.

Most respondents argued that disciplinary interventions were not always effective and claimed that approach for improving safety performance must be premised on **rehabilitating the employee**. Yet, they stated that leaders must still **be tough on standards** and should not allow blatant disregard of standards. To deal with this, three suggested that each case be dealt according to its severity.

Building on the above and to advance richer understanding, the interviewees were asked: “How do managers at this mine ensure that employees report safety incident without the fear of victimisation”?

The interviewees stated that employees were constantly reminded about the imperative of reporting safety incidents. Akin to that, employees who were in fear were encouraged to report the safety incidents namelessly. Furthermore, when there was a safety incident, **employees were not treated as culprits.**
Respondent 3 stated that:

> “Um, well, usually an investigation takes place and then in most of the investigation the **guy that failed to adhere to the procedure is not treated as a victim, he is treated as part of the investigation** team to understand how it failed. Usually they are **not treated as criminals**; usually **they are treated with the same respect** and not as a criminal if you wanna put it like that. Whether that is the right or wrong approach that could be questionable. Again you know some time we are so in the mood of trying not to make them feel like a criminal because then you can’t get the right info to put the right procedures in place. However, **if you condone that type of behaviour if you did wrong by not addressing that; you run the risk of creating cultures that it’s alright if you do that**. So, it should be handled with care I think, because obviously if he doesn’t comply, the next time he doesn’t comply he will be killed as well. So it’s a fine line but that’s how we usually treat it to get the right info to put procedures in place.”

Interviewee 5 commented that:

> “In our system, ok, most of the guys or employees who are at the shop floor don’t have access to the systems but they can report directly to their supervisor and say there is an issue here, this is going to break or this is going to hurt me or it’s going to hurt my colleague. Then, they can report that through the system and in that reporting you don’t need to put a name that it was reported by so and so, it can be anonymous to say there is a danger there”.

"The single greatest impediment to error prevention is...that we punish people for making mistakes. We need to accept that errors are inevitable, that they are a part of the human condition (how we learn), and that they are indicative of system flaws rather than an individual's character flaws" (Chera, et al., 2016, p. 880). Open communication and reiteration of the message to the mineworkers seem central in encouraging them to report safety incidents. Interviewee 6 expressed an opinion that:

> "I think it's just **repeating the information over and over again as part of the training** to make sure they do report everything…, let's say the guy that didn't comply; is **not treated as a wrong doer**, then people are open to report incidents. That atmosphere that is created ensures people step up and say this is what has happened – whether right or wrong".

While the respondents cited that different managers deal with safety situations differently, all agreed that safety was not only seen as mere statutory compliance prerogative; but also **seen as a core value.**

When asked a question about who had the authority to implement safety changes, interviewee 1 commented that everyone had influence to make safety changes.

> "It depends what it is, if it's a change in the work design definitely you need to work via the Engineering department and then if it's just the procedure then you need to get the relevant person who's responsible for that procedure and they implement it. If it has to do with **the just culture**, it's all about how you **make people aware** and then you **get your communication out** so hence I am saying to change that whole, it depends what it is. So anyone can implement change; but it will depend what's that required change and then the procedures will guide you in terms of who is accountable to implement those changes".

### 5.4.5 Perception of management behaviour towards safety

This category comprised of four questions. These set of questions were designed to establish the current perception of employees on their leaders towards safety. Asked to explain who between employees and managers are held more accountable or responsible when accidents or incidents occur; and how that accountability or responsibility is ensured, four stated that it is not as straight forward matter; and that it depended on the outcome of the incident investigation. Two indicated that the management were in most cases held accountable and that employees were not treated as victims.

One respondent echoed that:

> "In our cases it's more of the, I guess it varies hey, because if for instance it's a lost time injury, the Production Manager is the guy that will be responsible, who will feel the pain or the General Manager; but the employee who got injured actually does not really get impacted in terms of um, you know the company's policy; so **it's the leadership that gets more penalised** for such incidents".

Asked to comment on how management of the mine viewed breaking of safety rules (even when they don't result in any serious incident or accident), the respondents asserted that breaking of rules was not tolerated.

Interviewee 1 stated that:

> "Seriously, so **every incident we view it very seriously**, if it is a break of the rule for whatever reason whether the guy had no options but to break the rule we still go through the entire investigation process to find out what exactly has happened so we don't take any short cuts".

### 5.4.6 Investment efforts for to enhance safety and improvements

Two questions were posed in this category. The respondents were asked to describe the safety training focus area at their mine. They commented that the safety training was mainly a broadly and balanced approach, and was not necessarily premised on one particular aspect of safety. While it was wide focus, however, the respondents mentioned the training tended to lean towards changing the individual's behaviour.

The focus area of training highlighted by the interviewees are **systems, controls, individual behavior, safety culture, hazards and risk assessments and incident investigation**. Notably, missing in this list safety leadership training. This revelation could pave the way to understanding why despite such good systems in place, the mine suffered the recent fatal accidents.

One respondent held a view and mentioned that:

> "We don't have a specific training for safety but what we emphasise is; you would have your **induction** for instance; and that covers the general and then the guys would go to the section and they would have **on the job induction** and in that on the job induction it gives **training on the particular tasks** that the guys will be doing, **how to manage themselves and conduct themselves** on those or when doing those tasks. So it **focuses more on you as an individual and the job** but more on you as an individual, your **behaviour**. If for instance you are fatigued on that training you will be told, oh, not necessarily be told but you will be drilled to know that look, now I am fatigued and I need to take a break whether my supervisor likes it or not because I am putting myself on the line of fire here and I am going to take a break. So that 15 to 30 minutes you are allowed to take. So it focuses more on you as an individual, make sure that you, **you as a person** go home safely before, and **don't let your life be controlled by another person or be on the hands of another person**".

Asked to provide insights on what efforts or investments are being made by the mine management to improve safety, they all concluded that enough efforts were being made and that the mine had invested a lot of financial resources resulting into multiple of millions of Rands to improve safety at their mines.

### 5.4.7 Result validation through peer debriefing

Having gained insights and learned what themes were emerging from the interviews, the next step was to conduct a peer debriefing interview with an industry expect. As conferred earlier in section 4.1.1, peer debriefing (McMillan & Shumacher, 2001) supports the credibility of the data in qualitative research and provides a means toward the establishment of the overall

trustworthiness (Lincoln & Guba, 1985 in Spall, 1998) of the findings. At this backdrop, an interview was conducted with a leader who have compiled vast experience in safety management, both in locally and abroad.

To protect and guarantee the anonymity of the peer debriefing respondent, his name and the organisation that he is associated with have not been mentioned. The real names of countries mentioned in the interview by the expert have also been given a pseudo name (Country A, Country B, etc.) to ensure that his identity is no way jeopardised. With this understanding, the peer debriefing expert will be referred to as '**Mr Safety**'.

**Mr Safety** was instrumental in driving the improvement of the safety performance of a mine to a world class performer as depicted by Figure 5 below. The graph presents the result of the best safety performing mine as measured in terms of Total Recordable Incident Frequency (TRIF). TRIF represents the number of injuries in every one million man hours in an operation.

The depicted below results demonstrate that over a period of 14 years, the mine has moved from dreadful performer to becoming a benchmark world class safety performer. In particular, there is significant improvements within the last and recent five years. The trend show that it is possible to consistently improve safety performance of a mine.

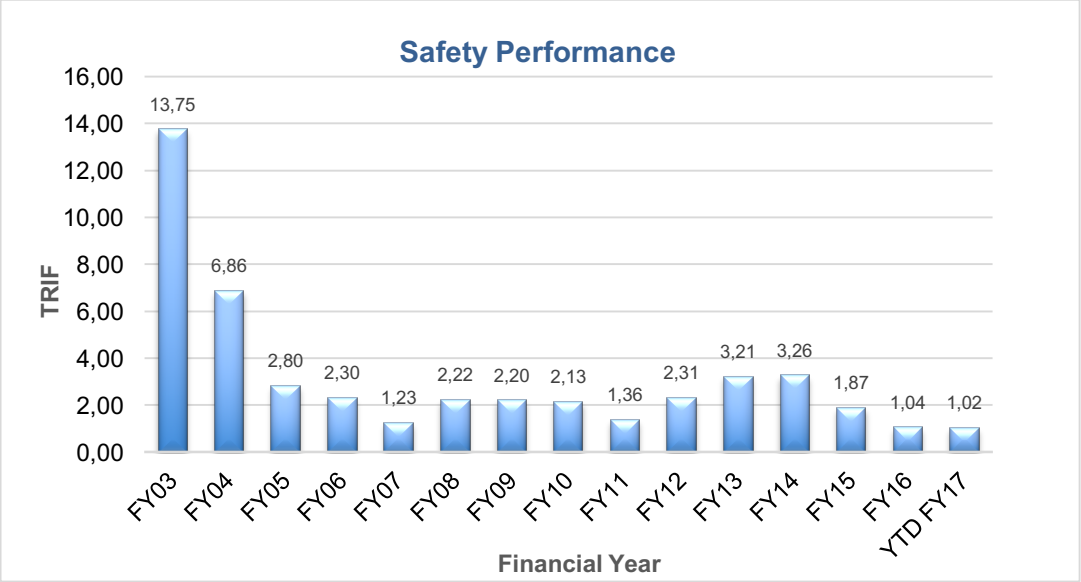


**Figure 5: Trend showing continuous improvement in safety performance from a good performing mine (Source: Information supplied by the company)**

To avoid any confirmation and anchoring bias responses from **Mr Safety**, the emerging themes were not shared upfront with him. Confirmation bias refers to "the tendency to seek out information that reaffirms past choices and to discount information that contradicts past judgements" (Robbins & Judge, 2013, p. 213). "Anchoring bias is a tendency to fixate on initial information, from which one then fails to adequately adjust for subsequent information" (Robbins & Judge, 2013, p. 212). Only later through the discussions, the themes were shared with **Mr Safety**.

At this backdrop, the researcher ensured the credibility of the validation process of themes that emerged from the interviewees.

**Mr Safety**, pointed to the need for a leader to ensure that employees were well trained, capable of doing their jobs and understood the standards well, are receiving the necessary training, development and experience on an ongoing basis. Mr Safety also emphasised that it was important not to view **safety culture interventions** as sprint but rather as marathon or dynamic progression. A leader should also be **personally involved in supporting and carrying out employee development**, as this will demonstrate the importance of ongoing development.
Asked to provide insights on how this mine's performance was achieved; **Mr Safety** offered the following testimonial:

> "We've got a TRIF of less than one based on one million hours; so that's world class performance. So what has happened is, number one, when we started the plant there we went on a very **rigorous training regime**. We made absolutely certain that **people were capable of doing their jobs** but then also that they **understood the standards**, the systems when we operate, etc., but much more importantly what we did is **focused very strongly on culture** so once every three months we have a culture intervention".

**Mr Safety** advocates for safety benchmarking, continuous learning, incentives and **leadership training** as a critical component to cultivate a continuous safety improvement of a mine.

> "Look we've come down a journey for quite long in this company, I have seen most of the leaders have actually been sent to the Country C to go and spend some time on Du Pont; and when you spend time on Du Point, Du Point is a company that's been working towards

> safe approach or to other ideas. Most people have been exposed to ZIP (Zero Incident Process) with incentives, we've all been through the behavior of safety components, so, in general, if you speak to management and leadership it certainly, there is absolutely no doubt that safety is a core value and it should never be compromised. What we haven't done successfully is entrench that culture everywhere. So, that is what people would say but sometimes in behavior find alternate behaviors you know, in the spare of the moment, let's keep the plant going or we need cost cutting, we will cut it and accept the things will be ok but we don't challenge and that comes back to that inclusive workplace because in the inclusive workplace management of change will be improved because people will talk more and through conversation and debate you can get a better outcome".

In driving the improvements of a mine safety performance, **Mr Safety** seems to advocate that a mine leader must be able to **enthuse his/her employees to believe that they have control over the outcome of safety at their mines,** as opposed to some outside forces beyond their control.

> "There is a thing that people **focus on internal locus in control** so the minute, if you do that across the sites then you have people that are confronting the problem. It's not presented as, you know, this is a problem you need to solve for me, it's more, this is a problem and here are some of the options I thought of a solution, here is the lowest risk solution, here is my proposal, and here is what I am going to need from you which breads a different type of culture towards fixing things; and we are actually taking some of the work that we have done in a different country because we saw as higher risk and deploying it across our region now because it's as applicable in Country A, as applicable in South Africa but it's amazing that's worked in Country B."

Having explained the above reasons, **Mr Safety** was asked what where the core principles that were impetus to the seemingly impressive safety performance.

> "So what our core systems that support all of this is risk management and we focus on risk management at various levels so its material risk where you can have multiple fatalities, single fatalities, issue based risk. For example, when you bring the crane on site then you focus on a specific topic and how do you manage risk around that topic then

there is **team risk assessment**, typically a JSA (job safety analysis) where they assess work they are going to be doing and how they go about it. Then there is personal risk management so it takes 5 minutes, just stand back think if you are going to do. And then on the other side we had some of the systems, is just in **how do you design, plan, execute and improve work** so that you have a **cycle of continuous improvement** and this is very strongly into the hierarchy of control".

**Mr Safety** argued that it is impossible to achieve best safety result at the mine even with the world class safety controls in place. He seems to postulate that **safety systems and good leadership are intertwined** – almost congruent with "an egg or chicken simile".

"So if you design work well, implement higher hierarchy of control and so when speaking about leadership in safety it is difficult to divorce totally from this because **a good leader drives towards having good system**. Having the right people, having the right tools, equipment work places so in essence you can. If you set high standards here and you got leaders that are not in a space of zero tolerance, I mean **inclusive space** that is where you get the best safety outcomes but what you need to do is **not be tolerant towards poor systems, incapable people or places that are not designed well**".

Commenting further; **Mr Safety** provided more insights on what it takes to foster a culture of safety improvement in mining, he seems to suggest that **employees will automatically follow and learn from a leader who displays great leadership qualities**.

"Your behaviour speaks so loud that your followers can't hear you when you speak". Behaviour speaks louder than words".

**Organisational design, communication, structure and coordination** are all some of the vital ingredients that are poised to foster a consistent safety performance at the mine.

"So then, you look at the how you organise structures within your business. We've got a very strong matrix organisation where centralised, you have got functions supporting various operations from a functional perspective. The second one is what we value because ultimately your values need to drive behaviors so we need to work hard to assist

> to get alignment towards what those values mean, what behaviors they embody and then you know people to believe in them; and the next one is the way we work and the way we work is the summary of our safety strategy it has three components, so it's well designed work, and that comes to this, design and workplace as to how its designed".

**Mr Safety** seem to argue that not only having good safety systems and leadership in place is good enough. The makeup of the entire safety arsenal should **embody ambidexterity**, that is; capable to **explore and exploit** on an improvement continuum.

> "Then there is a culture of continuous improvement, now the first thing that usually popped up there is: has someone been sigma trained or do they know how lean works, that is one component of it. This is more of a **culture where people value change that leads to positive improvement and people challenging** their workplace but; that the enabler to that is an **inclusive workplace** because in an inclusive workplace a person comes to work as a confident individual willing to speak up, willing to challenge the status quo and willing to mention when things are not the way they should be so that it can be continuously improved and the continuous improvement is actually in well designed work. So how do you design your systems better, your people systems better, your workplaces better, your tools better. So that is the summary – just thought I should give you our framework".

> "Because it's about an inclusive workplace, it's about our values, it's about well designed workplaces and then it's about culture of continuous improvement. So, that has driven positive safety performance, another component that has contributed to improvement in safety has been the legacy from being a really big company and very rich strong systems, a good example would be our risk management systems on how we manage critical controls to prevent fatalities in specific areas, with regards to that, our focus is very strongly on catastrophes…,"

It seems as if **Mr Safety** and his mine were able to uncover the 'sweet spot' of integrating their safety system to drive a positive safety culture. Asked on how is adherence to safety standards and procedures are encouraged, **Mr Safety** asserted that **they were less tolerant on blatant violations of incidents where you you an employees were fully aware of the consequences and that they were not supposed to be doing**.

> "The positive reinforcement is always stronger that the negative reinforcement; but once again it's linked to risk. So what we do here is there are some fatal risk behaviors, so if you have a certain behavior you know, walk under a suspended load or you enter confined space without permit, that has more severe impacts that some others so **we are less tolerant on (unsafe) behaviors** there. So **that is the stick side** and on the **carrot side we are just commending behaviours that are aligned to our values** and **we do show care**. Let's go back to that question you had on recognition, well **we do recognize positive behavior**".

**Mr Safety** safety provided more insights on how his mine used evidence based management to root out unsafe habits. **Mr Safety** point to **how they practically practice care** and aligned to education, behaviour rehabilitation and the mine's consequence management process.

> "Things like these takes analysis as well and then it has to link back to your values so I will give you an example: We did analysis on alcohol on people that enter the site with a positive alcohol reading; ok, so, we do a sample, we take one out of every 20 people and 3% are positive; no, it's not that high but let's say – so if you extrapolate that and you say of the 19 that you didn't test 3% would be positive and you look at that as a total on a cycle of a 1000 people, it's just unacceptable that, you know. A certain amount of people is; 30 people are under influence on your site so what we did there is change the system to change the behavior so we have alcohol test. Every single person is tested on alcohol and then a **non confrontational way on the first offense, you know someone would be, take the day off without pay**, **on the second offense we would refer them to an EAP or Employee Assistance Programme** you know; is there maybe a problem with alcohol abuse? And on the **3rd offense it will most probably transition towards you know disciplinary**".

Mr Safety contends that in order to influence the safety culture in a positive way, **the old ways of managing safety at the mines should be destined for the dustbin**; if you are going to achieve any meaningful improvements. He appears to advocate for a stance that mine leaders should **strike a balance between being tough on standards and soft on people**. Chera, et al., 2016 asserts this view.

> "…, we transitioned. In the old days being with the company for over 20 years; and I worked here and I have worked in Country A. I have worked in quite a few countries and on mines and on projects. We used to be system based; there is a rule, did the person follow the rule, it would be consistently applied. Is the outcome fair; and, but we've transitioned to, you know the just culture model so in essence you look at number one intent – was it a violation the person will … then that's disciplinary **but people make mistakes, people have lapses and people experience slips** so was it a mistake; lapse or slip and then the level of awareness that they should have had so I would not expect someone that does fatal risk work working at heights to have these types of mistakes because there are checks and balances but linked to that, we follow a disciplinary"

In diverse organisations such mines, setting of the well-directed safety incentives to drive a positive culture behaviour is crucial. When asked a similar question to the other respondents; how the managers or he as a Senior Executive ensure that employees report safety incidents without any fear or victimisation; Mr Safety signified an **inclusive culture**, again.

> "That's, it's part of the inclusive culture where, there, you shouldn't bring out a stick when people report things, it should be so. Firstly, when there is series of events, we do an ICAM (Incident Cause Analysis Method) analysis where we look and we focus very strongly on **organisational factors**. Traditionally if you think at way back, it would be very easy because they just blame the person that was injured but very rarely do people. **Never do people act to injure themselves**; so the organisational factors that lead up to that is what we focus on so we attempt to fix from the business what can we do. Our incentive programme, once again, those KPI's, **if you set up your KPI's incorrectly** like **on some of our operations we used to have incentives that incentives zero first aid incidents and what we saw was that dropped tremendously but that's not what we want to see because when people have minor injuries they could have had more severe impact**. You would want to see those reported, so, part of our recognition is that you are reporting …, so the crux of this is that we drive a zero energy reporting, which means proactive reporting because after something has happened, you know, the outcome could have been quite severe, what we want people to, is to see the risk not necessarily just to report the events. So where we see risk and something could happen and you report that

but energy hasn't been exchanged, **we really recognise that quite strongly in our various businesses so that it stimulates a culture of reporting**."

When asked how he and other leaders get involved in safety, Mt Safety appeared extremely excited. Mr Safety **firmly believe that when leaders get involved, communicates well and become part of the team, some positive strides are made towards sustainable safety improvements**.

"…, that's a very good question. We've actually it's with that wiring, how we engage, as an example I, and it is risk based; so I go to every operation in a six-month period and then I am part of a team of executives so, some of us, like I have lots of operational experience. I've been a General Manager before as well as Operations Manager in various fields; so we take people that have line experience and then we typically take someone that comes from corporate affairs, that's never worked on a mine but they have a different view and a different set of eyes that look at behaviors or controlled. We then go to sites and we do reviews on our material risks so where someone could be killed; like working at heights, confined space entry, a furnace explosion, tailings dam wall failure, etc. We then spend time with teams and with the risk owners in that area and there is a whole reporting system through which that gets fed back, so on a regular basis. We, at various levels speak to various teams so to see if the controls that we have in the system have transcended all the levels in the business and that people actually, you know working in there as it is this environment understands what's keeping them safe. So there is actually a very stringent structured way that we get out into the field, speak to people and understand what is actually happening in the field. That's an extremely good question because some of the business units are being part of what was not entrenched in their culture, it's very easy for executives to sit in a tower and then you don't really know what is happening".

As the discussion was drawing to a close, Mr Safety was asked to give some insights what investments efforts were being made as his mine appeared to be great safety benchmark mining operation.

"Massive, our company actually now put in a context of our financial situations at mining is; our company has committed an immense amount but I am not going to give the figure

but it's an enormous amount towards safety; and once again all these components serves towards systems improvement, towards leadership development that is actually where **the biggest amount of money is going to leadership development** and then also to continuous improvement work but that is substantial. I am actually, I am on the leadership team and I am actually proud of some of the calls the board and our CEO has made on what has been allocated to improving safety".

Lastly, the emerging leadership themes from the other interviews were shared with Mr Safety and he concurred vehemently that those were absolutely critical. He emphasised that, nonetheless as he expressed earlier; such **leadership attributes should not be derived in isolation; outside well organised systems**.

"Number one, it's a **leader that values inclusion** because all too often, especially in the South African context we believe leaders need to have all the answers. It's so much more powerful just to speak to them because we shouldn't be convincing people of a strategy, they should be engaged in co-creating that strategy so **co-creation**, the second is just **alignment to the values**, you know most values in companies are aspirational or so, **values of care**, **togetherness**, **trust**, **excellence** and a good leadership would be the **embodiment of those values through behavior not words.**

## 5.5 Conclusion

This chapter presented a summarised result of the emerging themes based on the categories of the interview schedule with some direct quotations from the interviewees. Peer debriefing was also discussed to enhance the validity of the raw data received. In the next chapter the theme analysis process will be discussed as well as the themes as identified from the raw data in order to draw conclusions and insights from the research results.

# Chapter 6: Discussion of Results

## 6.1 Introduction

In this chapter, the results presented in Chapter 5 are discussed in more detail. The context of the result discussion is founded at the backdrop of the research aim to identify what leadership traits are needed for cultivating sustainable safety performance improvements in mining.

With this understanding, each of the two research questions is then explored. The research questions are within the context of the literature reviewed in Chapter 2; and the results obtained from the interviews presented in chapter 5. The chapter further discusses the derived themes from this research project. Moreover, the research questions are tested at the back of the research findings.

## 6.2 Theme analysis

In determining the emerging themes, the researcher looked and established for common themes. The emerging themes were categorized on the basis of the research questions classifications. In analysing the raw interviews results, a narrative approach (illustrated in figure 6) proposed by Riessman (1993) was applied.

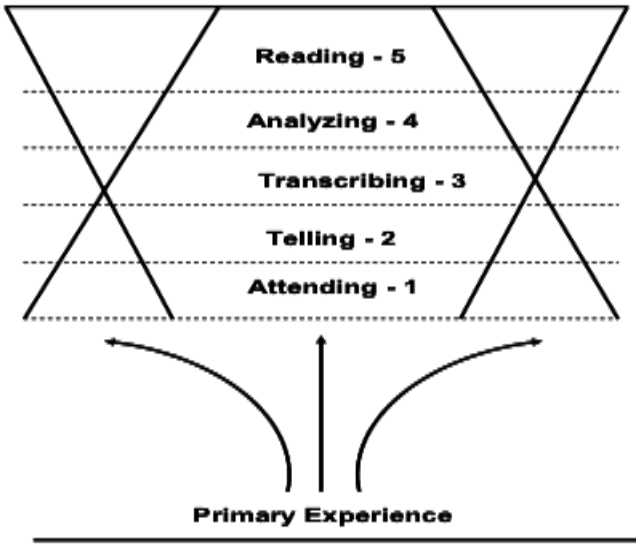

**Figure 6: Narrative approach in qualitative research (Source: Riessman, 1993)**

The narrative approach of analysing qualitative research raw data involves five levels of representation, and Riessman (1993) in Huberman & Miles (2002, p. 246) explains the levels of representation in this research process.

In applying this model, recordings interview with the respondents who consented to recording was employed, followed by transcriptions. Riessman (1993) contents in this model that recording and transcribing was essential in narrative analysis. As prescribed by model, where applicable, the entire interview discussions were recorded; with the transcriptions only derived for the selected portions for detailed analysis.

Furthermore, repeated listening of the interviews were conducted and this provided better insights into the narrative text. This is consistent with Huberman & Miles, 2002, p. 246) assertion of transcribing lead information into text. In addition, responses to the similar questions were deduced; and common emerging themes such as same or similar words, phrases, sentences were noted. This allowed for toe-to-toe comparison. At this backdrop, the emerging themes were explored.

### 6.2 Leadership traits required

**What are the most critical, commanding and effective leadership traits required to leverage the processes and systems for sustainable safety improvement in the mining industry?**

From the research results it seems that building and nurturing a culture of relentless safety improvements in mining operations requires more than just systems, procedures, standards, controls and policing of employees. Based on interviews undertaken with employees of an international mine that has experienced challenges with safety incidents (including fatal incidents) over the last five years from a coal operation in South Africa and a peer debriefing interview with an experienced safety expert; the study has revealed that leadership attributes play a decisive role in cultivating improvements in safety performance of a mine.

Some mine leaders were able to achieve good safety performance whilst some failed

despondently. This finding is consistent with the assertion echoed by Mullen, Kelloway, & Teed (2011) who contends that, inconsistent style of leadership takes centre stage as a predictor of safety behaviour. Passive styles of leadership, including laissez-faire leadership, have been associated with negative perceptions of safety climate and, indirectly, increased workplace injuries (Zohar, 2002a in Mullen, Kelloway, & Teed, 2011).

A summary of the identified themes is presented in table 7 below.

**Table 7: Identified themes in leadership traits required for sustainable mine safety**

| LEADERSHIP TRAITS | LEADERSHIP POWER BASE |
|---|---|
| Ability for leading change | Toughness on standards |
| Care for workers | Recognition and rewards |
| Inclusivity | |
| Inspiring and influencing | |
| Effective in communicating | |
| Action orientation | |

The themes that emerged were linked back to the literature reviewed in Chapter 2. This themes identified from this research project are now discussed below.

### 6.2.1 Leading change

Leading an organisational change had desire consequences if not the change process was poorly managed. Transformation occurs as a response to external pressures threatening the sustainability of the organisation while operating in a particular manner or can be a proactive strategy to adapt to change before being forced to do so (Cummings and Worley, 2009 in Maphalala, 2012, p. 49). At back of the market conditions, an economic decision was reached to divest from '*Old SafeCoal Colliery'* and transform into a new mine, '*New SafeCoal Colliery.* During this transformation, the mine experienced series of safety incidents, including more than one fatal accident.

Maphalala (2012) cites Senge (2006), who established the three levels of organisational leaders that would spur a successful organisational transformation process. “These are the executive leaders who must shape the overall environment and take ownership of the initiative; the line leaders who must integrate the initiatives into daily work; and the network leaders who must help and spread new ideas and practices throughout the organisation” (Senge, 2006) in Maphalala (2012). This is an indication that even with strong safety systems and controls; without exemplifying leadership, this was inadequate.

It is evident that it was truly impossible to design 100 percent fail safe systems and controls at the mines. Parter (2015) asserts that change is a step process. Such an understanding warns that organisations must exercise a cautionary when going through a change process. Too many leaders founder due to an impatient drive to be at the top tomorrow, although success may be several ladder rungs away from where they are (Parter, 2015, p. 25). It is similar to attempting to reach the opposite side of a room in one step; attempt an overly ambitious leap, and it is likely you will fall (Parter, 2015, p. 25).

Breaking away from another company where the dominant culture was strong system orientation; this culture swirled down into the newly formed mine and proved to be huge liability – at least in terms of safety performance. “Leadership must create an environment in which people accept the need for change and commit physical and psychological energy to it. Motivation is a critical issue in starting change because ample evidence indicates that people and organisation seek to preserve the status quo and are willing to change only when there are compelling reasons to do so” (Cummings & Worley, 2015).

“But we shouldn’t ignore the potentially dysfunctional aspects of culture, especially a strong one, on an organization’s effectiveness” (Robbins & Judge, 2013, p. 551). The mine leaders and mineworkers continued to embrace this dominant culture, even though the situations and context where completely different; requiring a different approach. When an organisation undergoes institutionalization and becomes institutionalized – that it is, it valued for itself – it takes on a life of its own, apart from its founders or members (Robbins & Judge, 2013).

The acceptable behavior of from *Old SafeCoal Colliery*, coupled with economic pressures, remained evident to the mine leaders and this habits of strong system focus, stifled and compromised the much needed adaptation and focus, safety.

This is in congruence with Xu, et al., (2014) findings. With the understanding that different context requires different leadership qualities, these result implied that, to navigate through different turbulent times, mining companies had to adjust and look to new principles to managing safety effectively. The authors established distinctive leadership traits that indicated that individuals with different attributes will achieve different results when faced with similar decisions.

The study further asserts that, traits were not an event but rather a dynamic process and evolving over time, arguing that these traits can become stronger or weaker, or could change in nature. The non stagnation of traits had significant implications to the mine leader in managing safety during a transformation process.

This argument affirms the need for mine leaders to continuously develop their leadership prowess if they are to be able to navigate through the guarantees of change at their mines. The changes will continue to come; whether at the backdrop of strategic business model reorganisation or fuelled by macroeconomic events, as in this case.

With the continued decline in commodity prices, mine continued to focus on cost cutting initiatives, leading to a lack of focus on safety management – production took centre stage. The employees were not clear about how the effects of the organisational change would impact them. This provides evidence that mine leaders lacked the agility and knowledge to lead change effectively while maintaining sustainable safety performance of their mines.

Cummings & Worley (2015) echoes this; and posits that in motivating change requires amongs other imperatives; it was desirable for leaders to create readiness for change. In managing the transition, the movement does not occur immediately and requires implementation of conditions needed to reach the desired state (Cummings & Worley, 2015). The statements made during the interviews provided evidence that mine leaders needed to be able to lead change effectively if they were to be successful in cultivating their mine' safety performance in a sustainable fashion.

This is coherent with the contentions new realities of leadership paradigm Daft (2011), which contents that leaders in the twenty-first century needed to adapt, quickly.

### 6.2.2 Showing care for workers

Caring was the common term used by all the respondents. This supports the findings by Giles (2016) top ten leadership competencies. A leader demonstrating high ethical standards conveys a commitment to fairness, instilling confidence that both they and their employees will honor the rules of the game (Giles, 2016). This study showed that leaders who embodies strong ethics and safety were rated top in his study.

On the contrary, leaders who appeared to care less about people, 'old leadership paradigm (Daft, 2011); of self-centred, heroism, command and control, stability and competition were likely to fail in their goals. The continued drive of culture zero tolerance is contributing to the double standards. Not all mine leaders embodied the culture of care, as some were focused on production at all costs. Most respondents argued that the attitude of the mine leaders had to change. Some mine leaders instituted disciplinary proceedings.

An example of this is that, at this mine, some mine leaders were quick to apply the disciplinary process when an employee violated a safety procedure; whether it was rightfully or wrongfully depending on the circumstance.

Nevertheless, at a mine which improved its safety consistently for 14 years, this was not the case – a just culture approach was derived by this mine. For example, although the mine had zero tolerance policy to alcohol; when an employees tested positive on alcohol the mine adopted non confrontational way on the first offense but rather offered the mineworker to take day off without pay; and on the second offense the mine referred the mineworker to an Employee Assistance Programme, which the mine paid for. This was to establish whether the employee had a problem with alcohol abuse. Consistent with its standards, only on the third time of the same transgression, disciplinary procedures were implemented.

This is consistent with the result of a study by Sarkus (2015) who posits that caring leadership helps to establish a more stable and sustainable foundation of influence and power. For safety

management to be positive, it must be partnered with an effective leadership technique (Dunlap, 2011). Sarkus (2015) dubbed caring, credibility and fairness as "*The Big 3*" critical leadership traits. The author argues that every leader who is credible, fair, and cares about his workers can push their performance to an entirely new level – particularly if three traits are used as their primary base of influence (Sarkus, 2015).

The study by Perz (2015), showing the ten traits and characteristics for great safety leaders also supports this. The study found that safety leaders who actively showed care about people were likely to succeed. **Mr Safety**'s mine understood this and was successful. Various studies (Avolio & Gardner, 2005; Gardner, Avolio, Luthans, May, & Walumbwa, 2005) in Zubair & Kamal (2015) dealing with the major attributes of authentic leaders supports this contention.

Production pressures led to mine leaders focusing on achieving production targets, often forgetting the human side of their mineworkers; and neglected their responsibility of assuring a safe work places. One respondent revealed that due to historical nature of the mines and politics, the safety of shop floor mineworkers was not emphasis and that this could not be tolerated today.

### 6.2.3 Inclusive workplace and co-creation

Majority of the respondents, including **Mr Safety** pointed to the leader who values inclusivity as a critical leadership quality. Most believed stated that mine leaders, especially within the context of South African believed they needed to have all the answers relating to mine safety. It is necessary to establish a platform where all mineworkers at levels are able to engage on matters of safety affecting their workplace. With inclusiveness, the ideation opportunity exists and the insights gained from the mineworkers, would assistance the mine leaders to plan and design the work efficiently.

Furthermore, this would help the mine leader get the buy in of workers and implement more workable systems. This will lead engaged workers involved in co-creating the espoused safety culture and strategies. This finding consistent with findings by Pless & Maak (2004), who argued that inclusiveness requires openness to different standpoints. "However, in practice it can become difficult to ensure this openness if intellectual traditions induce people to find the one right way,

the one and true answer" (Pless & Maak, 2004, p. 133). And yet, this can easily lead into a situation where a dominant voice is generalized and the rest marginalised (Pless & Maak, 2004); and this could transform into a "Groupthink" or "Groupshift" (Robbins & Judge, 2013) bias effect.

If this was allowed to dominate by mine leaders at their mines, the mine would not be able pounce on the potential diversity of ideas to improve safety from its workforce as the introverts would find it hard to voice the views. A mine leader who personified inclusiveness would also be seen as caring and candid. Pless & Maak (2004) argued that, in order to create a multicultural (such as a mine) and inclusive organisational culture; the vision needed be premised on and incorporate the following features:

- Creating a work environment that is free from any kind of harassment and is based upon respect for all individuals regardless of sex, gender, race, class, social or cultural origin, religion, disability, organisational level (Pless & Maak, 2004)
- Providing equal rights and opportunity for each employee as a citizen of the organization to achieve her fullest potential and to speak up and open (and thus, legal and political recognition) (Pless & Maak, 2004)
- Appreciating the contributions each employee can make by bringing their own perspectives, viewpoints and ideas, and demonstrating solidarity (Pless & Maak, 2004)
- Showing sensitivity to workloads and fostering (and recognizing the need for) an appropriate balance between work and personal life (Pless & Maak, 2004)

While it was vital for the mine leader to lead the pack, some respondents believed if each mineworker was to be the policeman for himself and for his colleagues in the name of brother's keeper, this would contribute to the needed culture of inclusion. The mine leader however, needed to develop the ability to cultivate this and **Mr Safety** also consented that an inclusive mine would translate in safe workplace.

### 6.2.4 Inspiring and influencing

Social learning theory (Bandura, 1986) points us to why some individual characteristics of the mine leader and situational influences are related to mineworkers' perceptions of a leader as effective leader (Brown & Treviño, 2006) in implanting the embodied culture of safety. The mine leader needed to be able to influence the mineworkers to act, speak and live safety; even in the absence of the mine manager. Yet in the context of social learning theory, for leaders to be able to influence their employees, they need to be attractive and credible role models.

Employees will look to the actions of top management as a benchmark for appropriate behavior (Robbins & Judge, 2013, p. 560). Social learning theory helps to explain why and how leaders influence their followers (Brown & Treviño, 2006, p. 597). In order for a mine to improve its safety performance; it required a mine leader who was able to excite the mineworkers to believe that safety is achievable; and indeed that, they have control over the result of safety at their mines, as opposed to some outside forces beyond their control.

Kapp (2012) affirms this. Those supervisors who are seen as holding a high value for safety realise extraordinary levels of safety performance from their employees (Kapp, 2012). The value of leadership in leading culture of safety comes when there is a culture where everyone is working towards safer outcomes. For such a oneness safety culture to be entrenched, it required mine leaders not only looking to implement fail safe systems and controls; but rather derive model leadership qualities.

It was clear that **Mr Safety** was passionate about safety and was strongly involved in the management of safety at his mine. The other respondents indicated that senior executives were required to conduct VCLs at their mines; and this was mine policy. Supporting this, Perz (2015) established that a leader who was passionate and visible, was likely to be a great safety champion.

Daft (2011) echoes this assertion. Leadership involves influence, it occurs among people, those people intentionally desire significant changes, and the changes reflect purposes shared by leaders and followers and influence means that the relationship among people is not passive (Daft, 2011).

Good leaders build a safety culture, maintain people's trust, control risks and position the organisation for enhanced success (Huber, 2012). Given the current economic, diversity and socio-political challenges relating to mining in South Africa, a mine leader who was able to inspire mineworkers positively is likely to cultivate a culture of safety improvement. The relational role as mentor, coach, moderator, facilitator and cultivator, the leader is no longer the sole author of a particular reality but rather becomes a co-author, and to some extent a lead-author, in a community of equal employees.

Dachler (1992); Dachler and Dyllick, (1988) cited in Pless & Maak (2004, p. 138). This findings asserts that the mine leader needed to assume a role of a guide rather than that of a grandiose character.

### 6.2.5 Communicating effectively

“The other necessary ingredient for a successful transformational initiative is that leaders must communicate the strategy throughout the organisation” (Maphalala, 2012, p. 68). The safety objectives and goals of the mines needed to reach out to the larger workforce. Furthermore, as it is the norm with the mining industry for Safety Managers to distribute learnings from other mines incidents, it was crucial for such communications to be shared with all employees in order to reach a shared understanding.

A study by Perz (2015) on the then traits and characteristics for great safety leaders and another by Giles (2016) affirms this finding. The ability of mine leaders to communicate effectively was a crucial quality for delivering a vision. While the majority of the respondents echoed that communication processes were adequate and an imperative, two mentioned that certain communication did not reach them.

One mineworker who worked shift revealed that when he was off, often communications relating to safety matters was sent out; and immediately on his return from off, he would be expected to understand everything that happened while he was off. This was often impossible as he needed to catch up with many other information.

This pronouncement, is indicative of the gap that exist in the communication methods. A different method of communication for such a group of mineworkers, who work different hours from the rest needed to be established. Failure to communicate effectively and reach out to all mineworkers, could be a barrier of leading a culture of sustained safety performance. Not being able to extend safety communication, could be misguided as exclusion of other mineworkers. Pless & Maak (2004) determined that, in order to create a diverse and inclusive organisational culture; the vision needed to entrench efforts premised at building and nourishing a culture of communication where inclusion and trust are the norms.

The mine leaders needed to be able to convince and get the message across the mineworkers. This finding is consistent with Robbins & Judge (2013), who posits that leaders needed the ability to influence a group toward the achievement of a vision or set of goals.

### 6.2.6 Action oriented and outcome focused

A study by Waldman & Balven (2015) focusing on responsible leadership, found that when specifically considering responsible leadership, it was not about whether organisations acted responsibly, but about how individuals acted and make decisions. The effects of production pressures were cited by some respondents as another reason why most accidents happened.

This is indicative of the fact that objectives of safety and production target were not always aligned or production was prioritised over safety by the mine leaders. To be successful, the mine leaders should not separate the two imperatives. To foster a balance and integration of production with safety, mine leaders who, albeit being result oriented, needed to focus on the means to an end. How the results were achieved was an important aspect for consideration by the mine management.

There is an expectation that – “underground mineworkers had to be part of the safety initiatives rather than just recipients of instructions from above (Maphalala, 2012, p. 50). “Their behaviours and attitudes had to be visibly transformed so that they could contribute in health and safety initiatives at the mines (Maphalala, 2012, p. 50)”. At first blush, this seem to be fair assessment to make; yet it falls short of addressing the critical role of the mine leaders towards safety.

It was the duty of the mine manager to lead the way; walk the walk and talk the talk. However, on the opposing end, it was the mine leaders who needed lead the way of the safety priorities rather than just them being the conduits of instructions to the mine employees. Through the same lens, it was the mine leaders' behaviours and attitudes had to be visibly transformed so that they could contribute in health and safety initiatives at the mines.

The mine that saw an impressive safety performance in a 14-year period, made heavy investment in leadership development, continuous improvements and systems improvements. This balanced focus included leadership training at centre and produced positive results. The mine showed it was uncompromising about safety and allocated significant time, effort and financial resources towards the improvement of safety. Safety leadership development at this mine was allocated allocate the majority of the resources.

The mine took an expanded long-term outcome perspective as opposed to short-term narrow economic perspective. The mine leaders were not only focused on the final result, but on the means to the end.

### 6.3 Leadership power base

**What leadership power base is most critical to inspire the workers in a positive way to work towards the achievement of a zero fatalities milestone?**

From a legal backdrop, mine leaders use and need to use their formal power as a means of encouraging safe behaviour at their mines. This is at the backdrop of the fact that from a legal and safety perspective, the mining industry is tightly controlled. Mine leaders have legal responsibility to for their employees' safety.

#### 6.3.1 Less tolerant to deviations from standards

Majority of the respondents asserted that the mine leaders needed to be tough on safety standards and less tolerant to safety deviations. This implied that they needed to employ and use

their power as mechanism. From the interviewees conducted, it was discovered that mine leaders already us formal power as a means to promote and improve the culture of safety at the mines.

The most commonly used formal power by the mine leaders to entrench the culture of safety are; “coercive power”, “legitimate power” and “reward power”. Robbins & Judge (2013) defines coercive power as the power base that is dependent on fear of the negative results from failing to comply and reward power as compliance achieved based on the ability to distribute rewards that others view as valuable.

Most leaders possess authority because they occupy positions of status relative to their followers, but attractiveness involves much more than authority and status (Brown & Treviño, 2006). Due to the legal appointments requirements for mine managers, legitimate power could not be avoided; it came naturally. To be able to influence the mineworkers, mine leaders needed to develop the six attributes discussed above relating to question 1 of this research project.

Coercive or reward power was an approach that mine leaders chose to practise, almost at their own accord. This inconsistent application was not effective as it was dependent on the mine leader’s leadership style. While legitimate power was found to be used consistently from a corporate level, some managers, resorted to coercive power more than others. One responded stated vehemently that in order to lead safety at the mine’s you needed to be a harsh leader.

While the author of this research document accepts that coercive power was necessary, it should not be applied with the aim of perpetrating pain or fear, controlling of mineworkers by force or punishment. But merely as compliance oriented approach, taking into cognisance the legal liability of the mine leader as an individual.

This contention is compatible with the findings by Taylor & Pattie (2014) who argued that, whilst it was not fully known whether all employees respond in a particular way or to the same extent, employees with ethical leaders are less likely to engage in deviant or unethical behaviours.

The above statement is fitting with the findings of research question 1. The main leaders not only have to rely on formal to drive safety improvements at their mines, they needed to use their personal power. The mine leader’s personal power would be derived his/her individual

characteristics. The result of question 1 implied that mine leaders who derived referent power – influence based on identification with a person who has desirable resources or personal traits (Robbins & Judge, 2013, p. 449).

To exert influence on mineworkers, mine leaders needed to have referent power. This understanding is consistent with the views of social-learning theory expressed by Bandura (1986) and Robbins & Judge (2013), that individual can learn through both observations and direct experience.

In **Mr Safety**'s own words pointing to action orientation; "Your behaviour speaks so loud that your followers can't hear you when you speak". Behaviour speaks louder than words".

### 6.3.2 Recognition and rewards

The use of the reward power at the mines seem to be a step well directed. Whilst this has worked to some degree, this alone was not enough as evidenced by the fatalities that the mine endured.

Vrooms' expectancy theory advocates that mine employees will be motivated to exert a high level of safety effort when they believe it will lead to good safety performance appraisal; that a good appraisal will lead to organisation rewards such as bonuses, salary, increases, promotions; and that the rewards will satisfy the employee's personal goals (Robbins & Judge, 2013). The motivation strategies used by the mine are safety bonuses, shopping vouchers, gifts and recognition – consistent with the performance-reward relationships advocated by Robbins & Judge (2013).

At the backdrop of this understanding, employees at supervisor position should also be incentivised for their efforts of improving and encouraging safety with their sections of responsibility. It was further determined that contractors were penalised for incidents but were not rewarding for good safer behaviour and this created I don't care attitude from the contractors.

An example of the recognition method used by the mines as discovered during the interviews was that, a mineworker who had did played safer behaviour, caring for his peers, either by coaching them or reporting a safety hazard that had potential of fatal accident; would be recognised by the

management in front all employees in the weekly safety mass meetings. The mineworker would be given a platform to share what he did with the rest of his/her colleagues.

This finding is comprehensible and well supported by the findings of Daft (2015) about the stewardship leadership. One of the key guidelines to effective stewardship leadership assumptions (Daft 2015) was that a leader embodied equality and rewards. Mine leaders who were able to derive the correct incentives to recognise good safety behaviours, will be able to stimulate a culture safety at their mines.

### 6.4 Testing of result against the research questions

Research question 1

**What are the most critical, commanding and effective leadership traits required to leverage the processes and systems for sustainable safety improvement in the mining industry?**

Based on the research findings and the literature reviewed, this research question objective was achieved and it is accepted. The findings are consistent with the literature reviewed; and the research project was able to determine the leadership traits that were likely to be effective to lead the cultivation of sustainable safety improvements and performance in mining.

Research question 2

**What leadership power base is most critical to inspire the workers in a positive way to work towards the achievement of a zero fatalities milestone?**

Similarly, the findings relating to this research question as premised within the context of the literature in Chapter 2 above have been satisfied. The research question objectives have been met. The findings relating to this question was consistently supported by various literature.

### 6.5 Conclusion

The emerging themes which the author dubbed '*8-point leadership mainstays for mine safety'* have been critically reviewed and presented. This are the common ingredients the needed to be embodied by mine leaders for improving safety performance of their mines. Of these eight themes, the first six traits are characteristic with the first research question and the last two traits are associated with the second research question.

This '*8-point leadership mainstays for mine safety*' are presented as a framework for cultivating sustainable safety performance in Chapter 7.

# Chapter 7: Conclusion

## 7.1 Introduction

This study was intended to investigate and establish what leadership attributes are necessary in improving and enhancing sustainable safety performance in mining. The identified traits formed the basis towards development of a framework of leadership traits that are the hallmark of sustainable safety management.

Based on interviews with employees from an international mine that has experienced challenges with safety incidents (including fatal incidents) over the last five years from a coal operation in South Africa and a peer debriefing interview with a safety expert; the study derived that leadership attributes play a magnificent role in cultivating excellence in safety performance of a mine.

The overall result is broadly consistent with the wider leadership literature reviewed; emphasising that certain leadership qualities were effective for different contexts. In line with the traits established, this study is consistent with literature reviewed. Consideration of the identified eight critical leadership traits for leading sustainable safety improvement at the mine reveal that the mine leader who embodied the qualities of authentic, ethical and responsible leadership or combination; was likely to be most effective in improving safety in mining.

## 7.2 Summary of main findings

**What are the most critical, commanding and effective leadership traits required to leverage the processes and systems for sustainable safety improvement in the mining industry?**

The premise for this question was stimulated by the discoveries from various research studies (Mullen, Kelloway, & Teed, 2011; Cismas, Dona, & Andreiasu, 2016; Sarkus, 2015; Waldman & Balven, 2015; Xu, et al., 2014; Giles, 2016; Lloyd-Walker & Walker, 2011; Huber, 2012; etc.,) reviewed in Chapter 2 of this research document. These studies provided empirical evidence that mine leaders can have decisive influence on mineworkers' behaviour and the safety culture.

From the result obtained, this question appears to have been well placed and provided useful insights to what leadership traits are effective to embed a sustainable safety performance and improvements within the mines. The mine that would be able to achieve a sustainable safety improvements culture; would develop or employ leaders that: – 1) are able to lead change, 2) signifies unrelenting care for workers, 3) are less tolerant on deviations from the agreed standards, 4) implement correct recognition metrics and rewards, 5) are inspiring, 6) are effective in communicating to get their message across to everybody, 7) embody workplace inclusivity and 8) are result driven.

It was important to note the context during of the mine as the research study was undertaken. The mine has transitioned from another mine in recent years. The mine transition was established to have had a significant and negative effect on its safety performance, which it is believed to have resulted into fatal consequences. This finding suggested that perhaps there was a vacuum in the mine's leadership ability in leading managing the transformation process appropriately.

This result pointed to the possible ineffectiveness of strategies employed by the mine to effect the demerger change process from '*Old SafeCoal Colliery'* to '*New SafeCoal Colliery'*. On the other hand, the strategies could have been adequate, perhaps poorly communicated, production prioritised; resulting into safety overlooked.

**What leadership power base is most critical to inspire the workers in a positive way to work towards the achievement of a zero fatalities milestone?**

The second research question was influenced similarly, by the findings derived from majority of the research studies reviewed in Chapter 2. In particular, a study by Huber (2012) was instrumental. In this study, Huber (2012) argued that courageous safety leadership focuses on people skills, communication, openness and transparency, honesty and integrity. In the study, he further contends that safety leadership is about empowering people to speak up when things are not right as well as accepting responsibility.

This perspective affirms that the current focus on the use formal power as dominant power base to encourage a culture where safety performance continued to improve; was not good enough. Isolated and strong focus on command and control, authority, systems and processes without the

right leaders at the forefront were not adequate to nurture an effective safety management framework. Integration of these safety interventions with model leadership seems crucial to manage mine safety in a sustainable fashion.

The dominant logic of command and control management style was tested examined and research question was designed to test the effectiveness or fragility of this approach. The power base alone was not effective. Furthermore, this question was considered to create and build on current and future knowledge of what power basis are pivotal for mine leaders to acquire in sustaining improvement in safety performance of their mines. Subsequently, the study was able to deduce that with the combination of the identified leadership traits and power base; the mine is likely to achieve its safety objectives.

### 7.3 The '8-point leadership mainstays for mine safety'

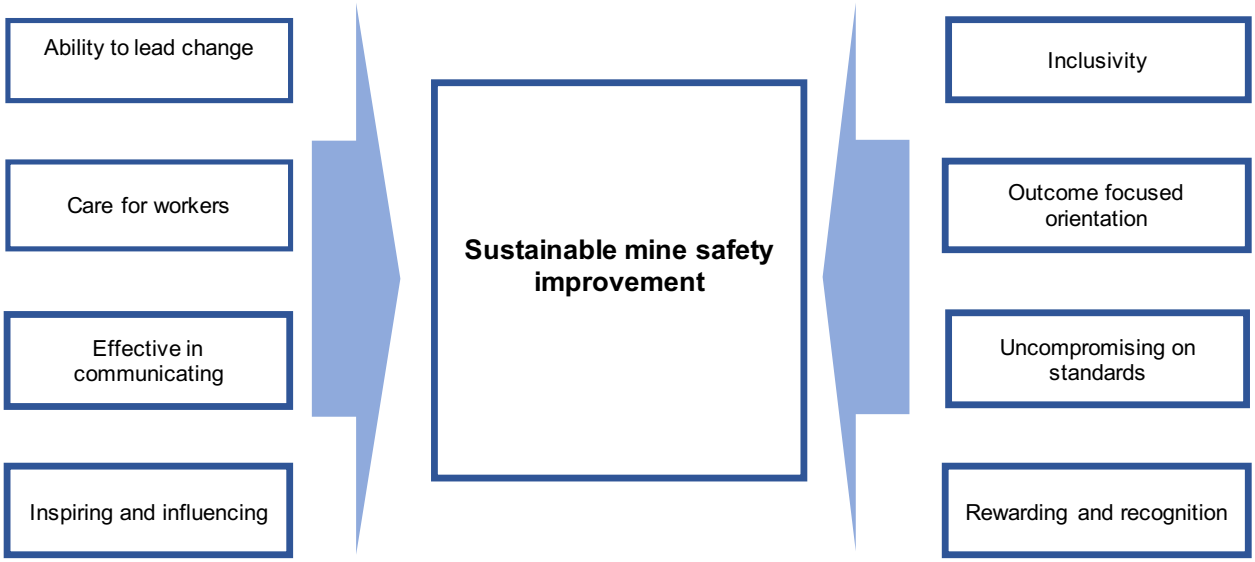


**Figure 7: The '8-point leadership mainstays framework for mine safety'**

This framework presents the critical leadership attributes that are required mine managers to develop arresting mine safety incidents. Mine managers who embodies these traits are likely to win the battle in of reducing fatal accidents at mines.

- **Ability to lead change** – This leadership trait refers to the ability of the mine leader to navigate the transformations process while maintaining good safety performance. The transformation can be due to external forces or self-imposed.

- **Effective in communicating** – The mine leader who is able get the message across at all levels.
- **Inspiring and influencing** – Refers to the ability of the mine leader to encourage mineworkers that; it was truly possible to achieve zero incidents.
- **Caring for workers** – This trait refers to a leader who was candid, showed care workers and understood a deeper meaning of the underlying cause of an event.
- **Rewards and recognition** – This attributes implied that mine leaders should be able to implement incentives that were driving correct behaviour and outcomes.
- **Inclusivity** – Encouraging diversity of ideas and able to foster collaboration between different departments.
- **Outcome focused** – A mine leader that will ensure that results were achieved without taking shortcuts.
- **Uncompromising on standards** – A mine leader that is assertive, but still does not neglect to encourage rules and standards.

### 7.4 Managerial Recommendations

This research project sets out prospects for the mine leadership create an arsenal foster for sustainable safety improvements in mining to reduce the fatal accidents at mines. Mine managers need to embrace the realities that, strong safety focus does not only imply putting in place good safety systems, procedures, standards and controls; but it meant that mine managers needed to develop the right balance of leadership skills to embody the mine values and safety objectives.

At backdrop of the The ‘8-point leadership mainstays for mine safety’ findings, the research unlocks opportunities for mine leaders and Human Resources (HR) managers to develop correct set of personalities tests to profile and match the best likely recruit to be responsible for safety at the mine during their recruitment.

The research established a crucial link between the identified leadership traits and power base approach necessary for embedding a strong safety performance culture at mines. It is important that mine leaders developed these new leadership traits; also juxtapose this with the correct and inclusive reward metrics. The authoritative style of traditional mine manager was no longer relevant in the twenty-first century. This form of power application needed to be extinct due the

premise that it has failed to yield any mine safety success; as demonstrated by the historic and recent mines fatalities.

Mine leaders should completely eradicate inconsistencies of execution at different mine operations.

As mine leaders develops the identified leadership traits, miner managers should guard against shifting focus only on the development of these qualities but continue to implement and maintain the good safety systems and controls. It is vital to understand that a good mine leader, even if they embedded all the leadership traits identified in the research will find it difficult and demoralising in an environment that was not conducive for sustainable safety improvements. In parallel, mine leaders need to continue constructing determined efforts and investments towards safety improvements tools.

All of these are the foundations of a sustainable safety culture at mines.

### 7.5 Limitations of the research

The research was founded against limited time. Due to this, only a mine in one (coal) commodity was considered and this could have affected the sample the variability. At this backdrop, a compromise was made on the diversity of the sample. It is possible that the culture differs significantly in other commodities and this could lead to biases in the results.

Many other factors outside of leadership that can affect the sustainable safety performance in mining. Due to time constraints; for the purpose of this study, elements were not tested at length as the focused mainly on the leader positives traits as the main driver of improvement of the mine's safety performance.

### 7.6 Suggestions for future research

The following recommendations are made for future research:

- The study has not been able to test the identified traits in other commodities. To confirm or expand on the results, the study be explored further in other commodities. Furthermore, as the sample only included direct mine employees and not contractors, it is recommended that contractors of the mine be included for any future studies in this area.

- Another study in this are recommended for future studies is in determining the correlation and relationship between safety incidents and organisational change. The proposed approach for this future is sample mines that has gone through change; and draw a comparison of safety their safety performances before, during the transition and post the transition.

### 7.7 Concluding remarks

The research topic has achieved the intended objectives. This research has contributed to the knowledge in safety management within the mining industry. The findings of this research has allowed new insights into what are leadership antecedents were critical to enact a strong culture of safety at mine. At the backdrop of the research findings, the critical leadership traits for cultivating sustainable safety improvements have been derived.

The two questions asked have provided better insights for mine leadership development, training and appointment. To assist mine leaders into the future, pertinent and practical recommendations were derived. The implication for business is a positive one in that the findings have a long-term outlook and sustainability. For example, with the reduction or complete eradication of mine accidents, the mine will good reputation with the union; employees will be happier and lead to higher productivity and no production due to stoppages due DMR interventions in terms of section 54 of the MHSA.

The 8-point leadership mainstays for mine safety provides a new opening for mining companies and mine leaders responsible for safety management to develop and lead the sustainable journey of safety improvements at their mines.

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# ANNEXURES

## Annexure 1: Interview Schedule

| BACKGROUND |
|---|
| How long have you worked at this mine? What is your current position within the mine? |
| **APPROACH TO SAFETY CULTURE** |
| What do you think has led to this mine's current safety performance? Please explain why. On the scale of 1-10 (10 being best) how would you rate your mine's safety? |
| Describe the attitudes / approach of the mine management towards safety and what approach you believe should be employed to achieve high standards of safety performance at this mine? |
| What methods and / or principles do you believe are important to achieve safety improvements? |
| Who is responsible for safety and have authority to implement changes about safety? |
| What is the culture of safety at this mine and who is driving this culture? |
| **PROCESSES AND PROCEDURES** |
| What processes, motivation strategies or principles are being used by the mine leadership to improve safety at this mine? How is risk assessment viewed by management at this mine? |
| Are employees asked for inputs when procedures are developed or changed or do managers change procedures unilaterally? |
| **LEADERSHIP APPROACH** |
| Describe what will be your ideal manager/leader for cultivating a sustainable safety performance?. What type of a leader do you believe will achieve the best safety results in a mine like this? |
| Do you believe that some leaders are better at managing safety than others? How and why? Give examples |
| How does your manager view and identify safety at this mine, as a core value, compliance or differently? |
| How does senior / executive management get involved in safety activities? |
| How does management at this mine treat unsafe work conditions and how does management perceive incidents of safety issues at this mine? |
| Does management give employees enough opportunities to make suggestions regarding safety issues and when |

| |
|---|
| employees report a safety problem, how does management react? |
| What in your opinion are the topmost five (5) critical personal attributes and / or for managers at this mine for managing safety effectively? |
| How are employees kept informed by managers about changes that affect safety at this mine? Furthermore, how are safety issues discussed in formal meetings at this mines? |
| How does your manager encourage you to be actively involved in identifying and resolving safety concerns here at the mine? |
| How accessible are managers when employees need assistance? |
| **POWER BASIS** |
| How does mine management ensure adherence and compliance to the safety rules and standards? |
| When there is an unsafe activity, how does management stop it? When employees make a mistake or do something wrong, how is it dealt with by the mine? |
| When management speaks about safety, is it about compliance or more than that? Please elaborate. |
| How do managers at this mine ensure that employees report safety incident without the fear of victimisation? |
| **PERCEPTION OF MANAGEMENT BEHAVIOUR TOWARDS SAFETY** |
| Does mine management communicate instructions and feedback effectively on safety matters? How? At what stage is safety emphasised by this mine management? |
| Between employees and managers who are held more accountable/responsible when accidents or incidents occur? Does management ensure that all employees are responsible and accountable for safe mining operations? |
| How does management view breaking of safety rules (even when they don't result in any serious incident or accident)? |
| **EFFORTS FOR SAFETY EDUCATION AND IMPROVEMENT** |
| Briefly explain the training approach about safety at this mine – does it focus more on systems, controls, people or culture? |
| At this mine, what efforts or investments are being made by your management to improve safety? |

**Annexure 2: Interview informed consent form**

**Programme: Masters of Business Administration (MBA)**

I am conducting a research on the critical leadership attributes that are critical for the creation of sustainable safety improvements in mining. Your experiences and views on the topic will contribute tremendously to understanding how leadership in mining can create sustainable culture of safety improvements. The study intends to discover new insights on how leadership can play a role to create safes mines.

To this is effect, you are requested to participate in a face-to-face interview to assist us better understand what leadership traits or attributes are key to foster safety within the mining industry. The interview should take no more 70 minutes. Your participation is voluntary and you can withdraw at any time during the interview without any explanation or penalty. The nature of the interview is in such a way that your identity will remain anonymous and all data will be reported without identifiers and no comments will be linked back to you as a participant.

By taking part, you confirm that confirm that you agree to participate in the interview, you understand what the research is about and you have an opportunity to ask questions. You further agree that you understand that your participation is voluntary and you can withdraw at any time without penalty or explanation.

Signature of Participant: _____ Date of Interview: _____

Signature of Researcher: _____Date of Interview: _____

If you have any concerns, please contact my supervisor or me on the details provided below:

**Researcher: Doctor Motswadire**
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