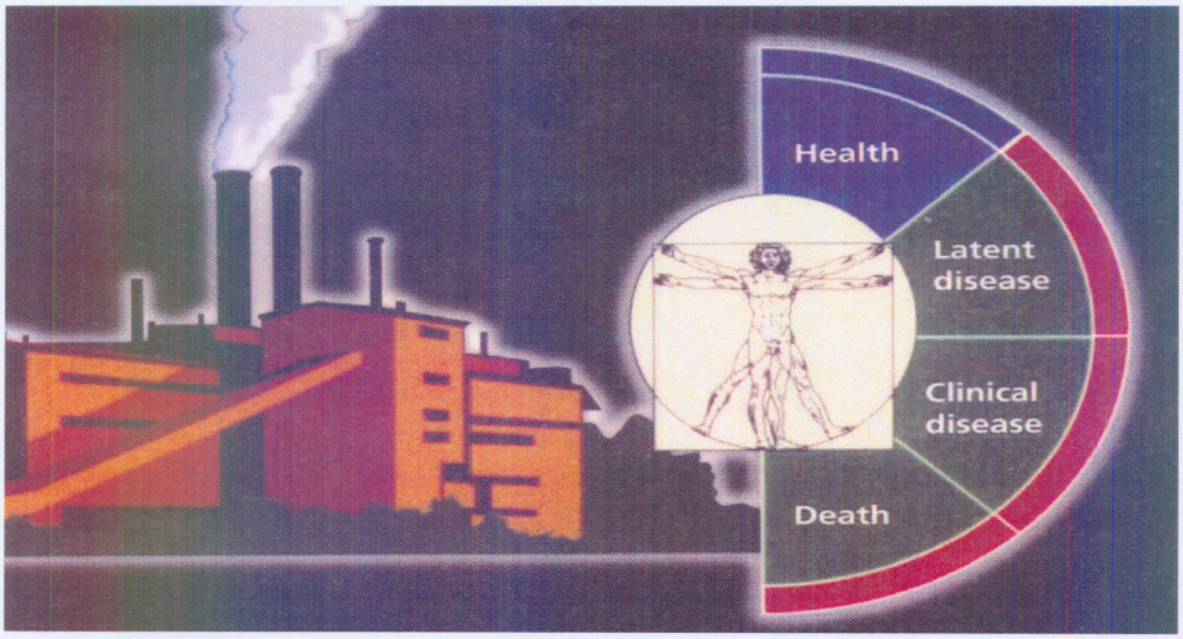
A continuous improvement strategy for an Occupational Health and Safety culture



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- Mrs. Karolien Nell, my study leader, for her support and guidance.

ABSTRACT

Hundreds of millions of people throughout the world are employed today either by the private or public sector in conditions that breed ill-health and / or are unsafe.

Traditionally health and safety management philosophies and practices have resulted in reductions in accident, incident and illness rates over the years, but it appears that further reductions will require new ideas. A shift in the way we think about health and safety is the answer. It is necessary to develop a workplace culture where health and safety is treated as an everyday dimension, not something you design a system for and then relegate to a manual. To ensure that a company's occupational health and safety culture continually improve a holistic approach is required.

The concept of an occupational health and safety culture has been studied by various researchers. A health and safety culture could be described as ideas and beliefs that all members of the organisation share about risk, accidents and incidents.

The purpose of this mini-dissertation is to determine the occupational health and safety culture of an organisation within the petrochemical industry in South Africa.

Seven critical success factors were identified as criteria for measuring the occupational health and safety culture, namely; risk taking of self and responses to risk-related behaviours of others, complacency, commitment, accountability and involvement, management style and communication, job satisfaction, responsibility and risk awareness.

The results obtained from the empirical study enabled the development and recommendation of a continuous improvement strategy that, if implemented, it is possible to uplift Company X's occupational health and safety culture to an interdependent state.

SAMEVATTING

Miljoene mense is regoor die wêreld in diens van of private of formele ondernemings waar werksomstandighede veel te wense oorlaat rakende die gesondheid en veiligheid van hul werknemers.

Tradisioneel oor die afgelope paar jare het beroepsgesondheids- en veiligheids-bestuurstelselfilosofieë en -praktyke gelei tot 'n vermindering in ongelukke, insidente en beroepsiektes. Dit blyk egter nou dat daar 'n nuwe benadering jeens bestaande filosofieë nodig is om verdere verlaging in statistieke te verseker. Die oplossing lê in die manier oor hoe ons oor beroepsgesondheid en veiligheid in die werksplek dink. Die kwessie van 'n werksplekkultuur word al hoe belangriker om te verseker dat beroepsgesondheid en veiligheid geïntegreer word in ons alledaagse doen en late, en nie net behandel of gepraktiseer word soos met die ontwerp van 'n stelsel waar jy terugverval na 'n handleiding toe nie. 'n Holistiese uitgangspunt is dus nodig om te verseker dat 'n maatskappy se beroepsgesondheids- en veiligheidskultuur volhoubaar verbeter.

Die konsep van 'n beroepsgesondheids- en veiligheidskultuur is al veelvuldig deur verskeie navorsers bestudeer. Sodanige kultuur kan opsommenderwys beskryf word as idees en veronderstellinge wat alle lede van die onderneming deel oor risiko's, ongelukke en insidente.

Die doel van die skripsie is om die beroepsgesondheids- en veiligheidskultuur van 'n onderneming in die petrochemiese nywerheidsektor in Suid Afrika te bepaal.

Sewe kritiese sukses-faktore is geïdentifiseer as kriteria waarteen die bestaande kultuur gemeet is. Dit sluit onder meer die volgende in: die neem van eie risiko's en reaksies op risiko-verwante gedrag van ander, selfvoldaanheid, verbintenis, aanspreeklikheid en betrokkenheid, bestuurstyl en kommunikasie, werkstevredenheid en verantwoordelikheid en risiko-bewustheid.

Resultate verkry uit die empiriese studie het gelei tot die ontwikkeling en aanbeveling van 'n volhoubare verbeteringstrategie. As sodanige strategie geïmplementeer word sal onderneming X se beroepsgesondheids- en veiligheidskultuur opgehef word na 'n onderlinge afhanklike staat.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS II
ABSTRACT III
SAMEVATTING III
TABLE OF CONTENTS V
LIST OF APPENDIXES VIII
LIST OF FIGURES IX
LIST OF TABLES X
LIST OF GRAPHS XI

CHAPTER 1: NATURE AND SCOPE OF THE STUDY 1

1.1 INTRODUCTION & BACKGROUND 1
1.2 PROBLEM STATEMENT 3
1.3 OBJECTIVES OF THIS STUDY 5
1.4 SCOPE OF THE STUDY 5
1.5 METHODOLOGY 5
1.6 LITERATURE STUDY 5
1.7 EMPIRICAL STUDY 6
1.8 LAYOUT 7
1.8.1 Chapter 1 – Problem statement and research proposal 8
1.8.2 Chapter 2 – Literature study 8
1.8.3 Chapter 3 – Empirical study 8
1.8.4 Chapter 4 – Conclusions and recommendations 8

CHAPTER 2: LITERATURE STUDY 9

2.1 INTRODUCTION 9
2.2 CULTURE 10
2.3 ORGANISATIONAL CULTURE 12
2.3.1 Elements of Organisational Culture 15
2.3.2 A Model for Organisational Culture 18
2.3.3 Changing Organisational Culture 20

2.3.4 Managing Organisational Culture 24
2.3.5 Measuring Organisational Culture 28
2.4 HEALTH AND SAFETY CULTURE 30
2.4.1 The concept of Health and Safety Culture 30
2.4.2 Defining Health and Safety Culture 30
2.4.3 Defining Health and Safety Climate 33
2.4.4 Health and Safety culture versus Climate 35
2.4.5 Organisational indicators of Health and Safety Culture 36
2.4.6 Health and Safety culture model 38
2.4.7 Assessing Health and Safety Culture 40
2.5 CONTINUOUS IMPROVEMENT STRATEGY 43
2.5.1 Defining continuous improvement 43
2.5.2 Drivers / strategies for continuous improvement 43
2.5.3 Building a Health and Safety Culture 44
2.5.4 Cornerstones of a Health and Safety Culture 45
2.5.5 Continuous Improvement Model 49
2.5.6 Six key principles for sustainable continuous improvement 48
2.5.7 Sustaining the Strategy 54
2.6 CONCLUSION OF LITERATURE STUDY 55

CHAPTER 3: EMPIRICAL STUDY 57

3.1 THE RESEARCH PROCESS 57
3.2 RESEARCH PLANNING AND DESIGN 59
3.2.1 Research question 59
3.2.2 Research design 60
3.2.3 Statistical techniques 61
3.2.3.1 Statistical background 61
3.2.3.2 Statistical definitions 62
3.2.3.3 Statistical application 62

3.2.4 Sampling design 63
3.2.5 Data collection design 64
3.3 DATA GATHERING 65
3.3.1 Target population 65
3.3.2 Preparation and structuring of the questionnaire 65
3.3.3 Instrument pilot testing 67
3.4 RESPONSE TO QUESTIONNAIRE 67
3.4.1 Demographic detail 67
3.4.1.1 Geographic dispersion of respondents 67
3.4.1.2 Job category respondents 68
3.5 DATA ANALYSIS 69
3.5.1 Statistical processing of data 69
3.5.2 Analysis of data 69
3.6 INTERPRETATION OF DATA 69
3.6.1 Factor 1 – Management style and communication 71
3.6.2 Factor 2 – Commitment, accountability and involvement 74
3.6.3 Factor 3 and 4 – Risk awareness and taking 77
3.6.4 Factor 5 – Job satisfaction 79
3.6.5 Factor 6 – Responsibility 82
3.6.6 Factor 7 – Complacency 85
3.6.7 Factor analysis summary 86
3.6.8 Health and Safety Culture Barometer 89
3.7 SUMMARY 91

CHAPTER 4: CONCLUSIONS AND RECOMMENDATIONS 92

4.1 INTRODUCTION 92
4.2 CONCLUSIONS BASED ON THE EMPIRICAL STUDY 92
4.2.1 Maturity of Company X's occupational health and safety culture 92
4.2.2 Occupational health and safety barometer 93
4.2.3 Continuous improvement model 94
4.2.4 Further consideration 94

4.3 RECOMMENDATIONS 95
4.3.1 Continuous Improvement Strategy 95
4.3.2 Occupational health and safety barometer 97
4.3.3 Change model 102
4.4 STUDY EVALUATION 102
4.4.1 Primary objective 102
4.4.2 Secondary objective 103
4.5 RECOMMENDATIONS FOR FUTURE RESEARCH 103
4.6 CONCLUSION 104
4.7 SUMMARY 106

BIBLIOGRAPHICAL REFERENCES 107

LITERATURE CONSULTED 112

LIST OF APPENDIXES

APPENDIX 1: ASSESSMENT QUESTIONNAIRE 113
APPENDIX 2: DETAIL ANALYSIS OF RESPONDENTS FEEDBACK 117
APPENDIX 3(1): DETAIL ANALYSIS OF JOB CATEGORIES PER EVALUATED FACTOR IN TABLE FORMAT ... 124
APPENDIX 3(2): GRAPHICAL PRESENTATION OF DETAIL ANALYSIS PER JOB CATEGORIES 131
APPENDIX 4: SUMMARY OF THE FACTOR RESULTS 138

LIST OF FIGURES

FIGURE 1.1: SCHEMATIC LAYOUT OF STUDY 7
FIGURE 2.1: LEVELS OF ORGANISATIONAL CULTURE AND THEIR INTERACTION 15
FIGURE 2.2: THE COMPETING VALUES MODEL AND APPROACH TO CULTURE 18
FIGURE 2.3: CONTINUOUS CHANGE PROCESS OF ORGANISATIONAL CHANGE 21
FIGURE 2.4: LINKAGES AMONG CULTURE AND THE SIX ORGANISATIONAL LEVERS 28
FIGURE 2.5: RECIPROCAL SAFETY CULTURE MODEL 39
FIGURE 2.6: THE SAFETY MANAGEMENT BALANCED SCORECARD 40
FIGURE 2.7: THE SHEWHART CYCLE 43
FIGURE 2.8: THE PERFORMANCE MAP – A CAUSATION DIAGRAM 45
FIGURE 2.9: THE BRIDGE METAPHOR – THE ARCHITECTURE OF SAFETY 47

LIST OF TABLES

TABLE 2.1: DEFINITIONS OF ORGANISATIONAL CULTURE 14

TABLE 2.2: DEFINITIONS OF SAFETY CULTURE 30

TABLE 2.3: DEFINITIONS OF SAFETY CLIMATE 34

TABLE 2.4: HEALTH AND SAFETY CULTURE BAROMETER 48

TABLE 2.5: CONTINUOUS IMPROVEMENT CYCLE – MODEL – SEGMENTATION OF EMPLOYERS 50

TABLE 2.6: CONTINUOUS IMPROVEMENT CYCLE – MODEL – SEGMENTATION OF EMPLOYEES 51

TABLE 3.1: PERCENTAGE DISTRIBUTION OF RESPONDENTS 67

TABLE 3.2: FACTOR 1 - MANAGEMENT STYLE AND COMMUNICATION 70

TABLE 3.3: FACTOR 2 – COMMITMENT, ACCOUNTABILITY AND INVOLVEMENT 73

TABLE 3.4: FACTOR 3 – RISK AWARENESS 76

TABLE 3.5: FACTOR 4 – RISK TAKING OF SELF AND RESPONSE TO RISK RELATED BEHAVIOURS OF OTHERS 77

TABLE 3.6: FACTOR 5 – JOB SATISFACTION 79

TABLE 3.7: FACTOR 6 – RESPONSIBILITY 81

TABLE 3.8: FACTOR 7 – COMPLACENCY 84

TABLE 3.9: PERCENTAGE RESPONSES OF HEALTH AND SAFETY ATTRIBUTES 86

TABLE 3.10: CRITICAL SUCCESS FACTORS OF A HEALTH AND SAFETY CULTURE 86

TABLE 3.11: HEALTH AND SAFETY CULTURE BAROMETER 89

TABLE 4.1: CONTINUOUS IMPROVEMENT MODEL APPLIED TO HEALTH AND SAFETY 98

TABLE A3.1: FACTOR 1 - MANAGEMENT STYLE AND COMMUNICATION 124

TABLE A3.2: FACTOR 2 – COMMITMENT, ACCOUNTABILITY AND INVOLVEMENT 125

TABLE A3.3: FACTOR 3 – RISK AWARENESS 126

TABLE A3.4: FACTOR 4 – RISK TAKING OF SELF AND RESPONSE TO RISK RELATED BEHAVIOURS OF OTHERS 127

TABLE A3.5: FACTOR 5 – JOB SATISFACTION 128

TABLE A3.6: FACTOR 6 – RESPONSIBILITY 129

TABLE A3.7: FACTOR 7 – COMPLACENCY 130

TABLE A4.1: EVALUATION RATING - MEAN AND STANDARD DEVIATIONS FOR JOB CATEGORIES 138

TABLE A4.2: IMPORTANCE RATING - MEAN AND STANDARD DEVIATIONS FOR JOB CATEGORIES 138

LIST OF GRAPHS

GRAPH 3.1: GRAPHICAL PRESENTATION OF RESPONDENTS' ORIGIN 67
GRAPH 3.2: GRAPHICAL PRESENTATION OF JOB CATEGORY RESPONDENTS 68
GRAPH 3.3: SUMMARY OF CRITICAL SUCCESS FACTORS OF HEALTH AND SAFETY CULTURE 88
GRAPH A2.1: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 1 117
GRAPH A2.2: DETAIL ANALYSIS OF FACTOR 1'S RESULTS 117
GRAPH A2.3: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 2 118
GRAPH A2.4: DETAIL ANALYSIS OF FACTOR 2'S RESULTS 118
GRAPH A2.5: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 3 119
GRAPH A2.6: DETAIL ANALYSIS OF FACTOR 3'S RESULTS 119
GRAPH A2.7: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 4 120
GRAPH A2.8: DETAIL ANALYSIS OF FACTOR 4'S RESULTS 120
GRAPH A2.9: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 5 121
GRAPH A2.10: DETAIL ANALYSIS OF FACTOR 5'S RESULTS 121
GRAPH A2.11: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 6 122
GRAPH A2.12: DETAIL ANALYSIS OF FACTOR 6'S RESULTS 122
GRAPH A2.13: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 7 123
GRAPH A2.14: DETAIL ANALYSIS OF FACTOR 7'S RESULTS 123
GRAPH A3.1: FACTOR 1 – EVALUATION PER JOB CATEGORY 131
GRAPH A3.2: FACTOR 1 - IMPORTANCE PER JOB CATEGORY 131
GRAPH A3.3: FACTOR 2 – EVALUATION PER JOB CATEGORY 132
GRAPH A3.4: FACTOR 2 - IMPORTANCE PER JOB CATEGORY 132
GRAPH A3.5: FACTOR 3 – EVALUATION PER JOB CATEGORY 133
GRAPH A3.6: FACTOR 3 – IMPORTANCE PER JOB CATEGORY 133
GRAPH A3.7: FACTOR 4- EVALUATION PER JOB CATEGORY 134
GRAPH A3.8: FACTOR 4- IMPORTANCE PER JOB CATEGORY 134
GRPAH A3.9: FACTOR 5- EVALUATION PER JOB CATEGORY 135
GRAPH A3.10: FACTOR 5- IMPORTANCE PER JOB CATEGORY 135
GRAPH A3.11: FACTOR 6- EVALUATION PER JOB CATEGORY 136
GRAPH A3.12: FACTOR 6- IMPORTANCE PER JOB CATEGORY 136
GRAPH A3.13: FACTOR 7- EVALUATION PER JOB CATEGORY 137
GRAPH A3.14: FACTOR 7- IMPORTANCE PER JOB CATEGORY 137
GRAPH A4.1: COMPARISON OF EVALUATION RESULTS PER JOB CATEGORY 139
GRAPH A4.2: COMPARISON OF IMPORTANCE RESULTS PER JOB CATEGORY 139

CHAPTER 1
NATURE AND SCOPE OF THE STUDY

1 CHAPTER 1: NATURE AND SCOPE OF THE STUDY

1.1 INTRODUCTION & BACKGROUND

Hundreds of millions of people throughout the world are employed today in conditions that breed ill-health and / or are unsafe ($Anon_a$, 1999).

- Each year, work-related injuries and diseases kill an estimated 1.1 million people worldwide, which roughly equals the global annual number of deaths from malaria.
- This figure includes about 300 000 fatalities from 250 million accidents that happen in the workplace annually. Many of these accidents lead to partial or complete incapacity to work and generate income.
- Annually, an estimated 160 million new cases of work-related diseases occur worldwide, including *respiratory and cardiovascular diseases, cancer, hearing loss, musculoskeletal and reproductive disorders, mental and neurological illnesses*.
- An increasing number of workers in industrial countries complain about psychological stress and burnout. These psychological factors have been found to be strongly associated with sleep disturbances and depression, as well as with elevated risks of cardiovascular diseases, particularly hypertension.

Making working conditions healthy and safe – the *raison d'etre* of occupational health and safety – is in the interest of workers, employers and governments, as well as the public at large. Seemingly obvious and simple, this idea has not yet gained meaningful universal recognition ($Anon_a$, 1999).

According to Sparks *et al.* (2001:489) major changes have taken place in the workplace over the last 40 years. The growth in the use of information technology at work, the globalisation of many industries, organisational restructuring, changes in work contracts and work time scheduling have radically transformed the nature of work in organisations. The workforces itself are also diversifying, with an increase in female participation, a growing number of dual-earner couples and older workers. It is therefore important to note that these changes could have an impact on the workforce's attitude concerning working healthily and safely.

An occupational health and safety culture is a sub-facet of organisational culture, which is thought to affect members' attitudes and behaviour in relation to an organisation's ongoing occupational health and safety performance. However, numerous definitions of "organisational culture" and "health and safety culture" that exist in both management and health and safety literature suggest that the concept of business-specific cultures is not clear-cut (Benjamin K, 2003: 7).

Occupational injuries and diseases have an important role to play in health and safety, particularly in developing and middle-income countries. By affecting the health and safety of the working population, occupational injuries and diseases have profound effects on productivity as well as the economic and social well-being of workers, their families and dependants (Sparks *et al.* 2001:500).

South Africa has more than 8.2 million workers who spend at least eight hours per day in formal employment in tens of thousands of factories and mines, on farms and other places of work (Van Vuuren, 1997:4).

The health of many of these workers has been affected by:

- Chemical agents, resulting in, e.g. skin problems, lung disease and systemic poisoning.
- Physical agents, resulting in, e.g. noise-induced deafness.

- Biological agents, resulting in, e.g. tuberculosis and Legionnaire's disease.
- Ergonomic hazards, resulting in, e.g. back pain.
- Psychological hazards, resulting in stress and stress-related diseases.

Occupational health and safety programmes focus on providing services, conducting research and disseminating information to improve workers' health and safety status. This involves collaboration among disciplines such as occupational hygiene, occupational safety, biochemistry, immunology, toxicology, epidemiology, pathology and occupational medicine. The prime responsibility of occupational health and safety services is to identify, control and prevent adverse health and safety effects caused by the working environment.

The responsibility for occupational health and safety lies within a wide range of authorities and is governed by at least twenty-four pieces of legislation. These authorities include the Departments of Labour, Health, Mineral and Energy Affairs, Agriculture, provincial and local authorities.

Occupational health and safety is everyone's responsibility. Well-managed occupational health and safety programs and the development of an occupational health and safety culture provide an operational strategy to improve productivity and control costs. In order for these programs to be taken seriously, it must be linked to the corporate strategic plan and be supported from the top down and bottom up.

1.2 PROBLEM STATEMENT

Company X, a global chemical and petrochemical company situated locally mainly at Secunda and Sasolburg, employs more or less 10,000 permanent and part–time employees. The company realised in the mid 90's that the standard at which occupational health and safety was conducted, neither fulfilled the legal requirements nor addressed the needs of the business environment within

which it had to function. Although an occupational health and safety system was implemented at the two local areas, the **need** for the **development of a continuous improvement strategy** was born. This strategy would describe where Company X measures on a barometer for continuing improving the occupational health and safety culture.

The benefits of a values-driven culture-enriched approach to occupational health and safety are many (Benjamin, 2003: 10):

- **It predicts the future**. Existing occupational health and safety performance measurement systems are all retrospective, and need to change to be prospective.
- **It is culture-sensitive and adaptable**. The process starts by assessing the current culture, improving from where you are to where you want to be.
- **It facilitates excellence**. To have a strategy and method to measure and manage general organisational culture which will increase efficiency.
- **It appeals to all employees.**
- **It only costs commitment.**
- **It is enduring**.

During previous external audits (i.e. Health and Safety management systems, Process Safety management systems, etc.) a general finding was raised that Company X's occupational health and safety culture has developed and matured significantly over the last decade and this has made some contribution to the elimination of significant incidents and injuries. It was however noted that the culture needs refinement to eliminate all incidents in placing more emphasis on certain of the health and safety management elements (management of change, contractor management and process hazard analysis) as well as general hazard identification and treatment.

It is thus proposed to do further research in the development of a **strategy for continuous improvement of an occupational health and safety culture**.

1.3 OBJECTIVES OF THIS STUDY

The main objective of this study is to develop a strategy for continuous improvement of an Occupational Health and Safety culture that will provide Company X **with a barometer** (i.e. a set of tools) that if used can be an effective planning tool and can help to provide clarity of thought.

The primary objective will be realised by meeting the following secondary objectives:

- Determining which segment the company or group of employees fall into.
- Identifying those attributes that are preventing further progress.
- Considering how these attributes may be overcome.
- Considering which of the identified attributes need to be applied.
- Considering how the motivations for the specified group can be used to get further engagement in relation to the identified needs.

1.4 SCOPE OF THE STUDY

The study will focus on the occupational health and safety culture at Company X, with specific reference to one of the chemical business units.

1.5 METHODOLOGY

The methodology followed in this study will consists of two parts namely an extensive literature study and an empirical study.

1.6 LITERATURE STUDY

In order to establish a sound theoretical background to the problem as formulated above, an in-depth analysis, evaluation and integration of the different aspects relating to the development of a continuous improvement strategy for an occupational health and safety culture will be conducted by paying attention to:

- Methodologies for the development and implementation of a continuous improvement strategy.
- Established matrices published for non-specific groups of employers and employees.
- A Health and Safety Culture Barometer.
- The change management process for the development and implementation of a continuous improvement strategy.

The aim of the literature study is thus to gain theoretical knowledge of a continuous improvement strategy and the development and implementation of such a strategy. The literature will further be used to identify ideal practices during strategy development and implementation. The knowledge gained from the literature study will be used to develop questionnaires for the empirical investigation.

The literature will consist of relevant textbooks, technical journals, magazine articles and publications on the internet.

1.7 EMPIRICAL STUDY

The empirical field investigation will focus on Company X, with specific reference to one of the chemical business units as the main employer against:

- What drives business units to achieve a certain level of performance?
- What distinguishes higher achieving business units from lower (areas where health and safety culture is weak and where it is strong)?
- Likely perceived issues for the company.
- The things companies need, to progress to the next level.

To establish the abovementioned aspects, the empirical study will be aimed at occupational health and safety practitioners, company management members, worker union representatives and employees measuring the psychological, behavioural and situational aspects of an occupational health and safety culture.

Questionnaires will be used to determine the occupational health and safety culture, measuring people's beliefs, values, attitudes and perceptions along various dimensions of health and safety thought to be important to the development of a health and safety culture.

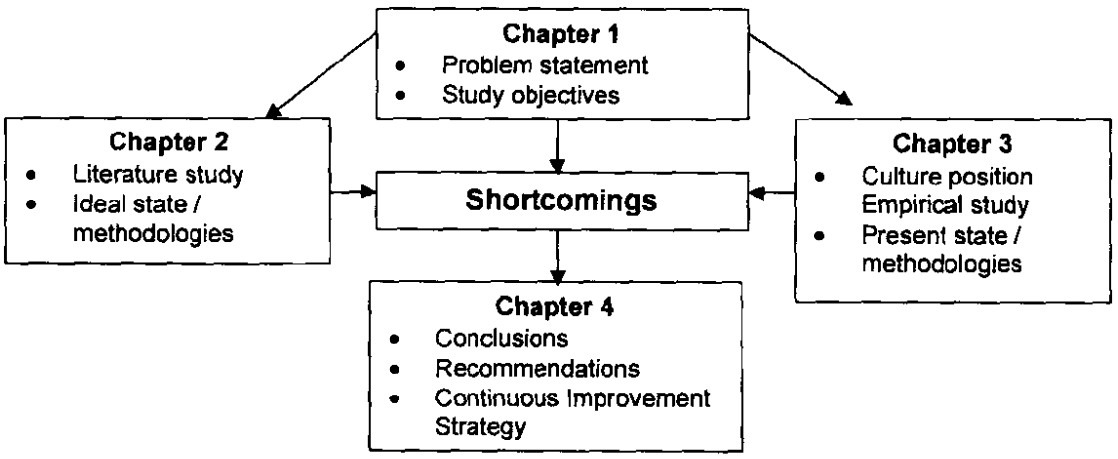
The questionnaires will be distributed through e-mail and personal contact. The return of the questionnaires will be followed up using e-mail, telephone calls and personal contact to ensure a high return rate. All questionnaires will be treated confidentially to ensure that facts will not be distorted.

The results will be statistically analysed using an appropriate statistical methodology. The analysed results will be used to draw conclusions and recommendations will be made regarding the development of a continuous improvement strategy for occupational health and safety.

1.8 LAYOUT

It is suggested that the mini-dissertation consist of four chapters. The relationships between the chapters are shown in Figure 1.1.

FIGURE 1.1: SCHEMATIC LAYOUT OF STUDY



The chapters will consist of the following:

1.8.1 Chapter 1 – Problem statement and research proposal

Chapter 1 undertakes to develop the problem statement and sub-problems. It continues by outlining the project objectives and motivation for undertaking the study, and concludes with the research methodology approach to undertake this mini-dissertation.

1.8.2 Chapter 2 – Literature study

An extensive literature study will be undertaken to identify the current research available in this field as well as indicating what opportunities exists for future research. Moreover, the content should portray the ideal state or methodologies for a continuous improvement strategy in occupational health and safety culture. Topics that will be discussed include published matrices for non-specific groups of employers and employees, barometers described as maturity grids and the change management process for the development and implementation of a continuous improvement strategy.

1.8.3 Chapter 3 – Empirical study

Chapter 3 will present an overview of Company X and present insight into the occupational health and safety culture position. It will furthermore present the statistical analysis of the empirical study and interpret and discuss these results.

1.8.4 Chapter 4 – Conclusions and recommendations

Chapter 4 will present the conclusions from the study. Recommendations will be made to address the shortcomings identified in Chapters 2 and 3. A strategy will be presented for the continuous improvement of a health and safety culture in business units of Company X.

CHAPTER 2
LITERATURE STUDY

2 CHAPTER 2: LITERATURE STUDY

2.1 INTRODUCTION

The objective of this chapter is to explain the concepts surrounding culture, organisational culture, health and safety culture and what constitutes a managerial health and safety culture as well as the overlap between these four concepts. These concepts aim to demonstrate the importance of a supportive culture in order to enable a continuous improvement strategy for a health and safety culture.

Cooper (2000:111) stated that many industries around the world are showing an increasing interest in the concept of "Health and Safety culture" as a means of reducing the potential for large-scale disasters, and accidents associated with routine tasks. A growing importance of achieving homogeneous worldwide health and safety cultures has publicly been expressed in the offshore, nuclear and shipping industries, but is not at all limited to these industries as the concept applies to all industrial settings.

Eckenfelder (2003:32) states that organisational culture will determine whether health and safety initiatives will be successful. The attitudes flow directly from the culture, and:

- Culture predicts performance.
- Culture can be measured and managed.
- Nothing is more important than getting the culture right.

This knowledge, together with the "tools" to act on it and the resolve to get on with it, can serve as a catalyst for every existing health and safety effort.

2.2 CULTURE

Culture can be analysed as a phenomenon that surrounds us at all times, being constantly enacted and created by our interactions with others (Schein, 1992:1).

Toca (1998:224) states that culture may be defined as the norms of behaviour and shared values among a group of people, where norms and behaviours are the common or pervasive ways of acting found in groups. He explains further that these norms persist because group members teach these practices to new members by rewarding those who comply and sanctioning those who do not. Shared values are the concerns and goals shared by most of the people in a group. These values tend to shape group behaviour and to persist over time.

Toca (1998:224) gives an example of such values by highlighting a situation in an industry where one of the values held by most workers was to be "macho" by not using hearing protection or other forms of personal protective equipment. Men working in a lead-acid battery assembly area refused to wear respirators even though sulphuric acid fumes burned their eyes and noses. The macho image was far more important than long-term health effects that workers did not really understand. The prevailing norm was to be macho, and members of the group were included or excluded on this basis.

According to Hellriegel *et al.* (2002:486) culture is unique patterns of shared assumptions, values and norms that shape socialisation, symbols, language, narratives and practices of a group of people. These patterns are divided between observable and hidden elements. Observable culture elements consist of practices, narratives, language, symbols and socialisation, whereas hidden culture elements consist of norms, values and assumptions. These elements are defined as follows:

- **Shared assumptions** are the underlying thoughts and feelings that members of a culture take for granted and believe to be true (Hellriegel *et al.* 2002:487).

- **Values are the basic beliefs** about something that has considerable importance and meaning to individuals and is stable over time (Hellriegel *et al.* 2002:488).
- **Socialisation** is a process by which new members are brought into a culture through consistent role modelling, teaching, coaching and enforcement by others in the culture (Hellriegel *et al.* 2002:488).
- **Symbols** are anything visible that can be used to represent an abstract shared value or something having special meaning such as uniforms, awards, etc. (Hellriegel *et al.* 2002:488).
- **Language** is a shared system of vocal sounds, written signs and / or gestures used to convey special meanings among members of a culture (Hellriegel *et al.* 2002:488).
- **Narratives** are the unique stories, sagas, legends and myths in a culture, often describing the unique accomplishments and beliefs of leaders over time, usually in heroic and romantic terms (Hellriegel *et al.* 2002:488).
- **Practices** are the most complex element of culture, but it is observable, such as taboos and ceremonies (Hellriegel *et al.* 2002:488).

Ashkanasy *et al.* (2000:402) defines culture as the collective programming of the mind which is manifested in four basic ways:

- Symbols carry particular meanings for culture members.
- Heroes are a culture's role models.
- Rituals are technically superfluous but socially necessary for a culture.
- Values are feeling-reflecting preferences for certain states of affairs over others.

According to Cleary (1999:10) culture is the lifestyle of a group that includes values, beliefs, artifacts and ways of behaving and communication of such a group. He further states that culture is acquired or learnt, thus no one is born with a particular culture.

Smit and De J Cronje (1999:269) state that culture could be defined as the beliefs and values shared by people in an organisation. Beliefs are convictions about the world and how it works. These beliefs are based on reinforcement by personal experience and that a person's beliefs can be influenced by the individuals with whom he associates. Values are the community's assumptions about what ideals are worth pursuing. Values are also based on personal experiences and the influences of the members of the community with whom an individual associates.

2.3 ORGANISATIONAL CULTURE

Over the past decade, a great deal has been written about organisational culture and the important role it plays in successful performance. Edgar Schein (1992), one of the leading authorities on culture, defines it as "a pattern of shared basic assumption that the organisation learned as it solved its problems of external adaptation and internal integration, that has worked well enough, to be taught to a new member as the correct way to perceive, think, and feel in relation to those problems" (Young, 2000:19).

Organisational culture is a concept often used to describe shared corporate values that affect and influence members' attitudes and behaviours. Health and safety culture is a sub-facet of organisational culture, which is thought to affect members' attitudes and behaviour in relation to an organisation's ongoing health and safety performance (Cooper, 2000:111).

It is generally thought that a well-developed and business-specific culture into which managers and employees are thoroughly socialised will lead to stronger organisational commitment, more efficient performance and generally higher productivity. Usually based upon a blend of visionary ideas, organisational culture appears to reflect *shared* behaviours, beliefs, attitudes and values

regarding *organisational goals*, *functions* and *procedures*, which are seen to characterise particular organisations (Cooper, 2000:111).

However, due to a lack of information on how culture works, or how it can be shaped, changed or otherwise managed in practice, there is no consistent definition of what organisational culture might be. The main difference between such definitions appear to reside in their focus on the way people think, or on the way people behave, although some focus on both the way people think and behave (Cooper, 2000:112).

Cherrington (1994:472) defines culture as the unwritten feeling part of the organisation which consists of a set of key values, beliefs and understandings that are shared by members of an organisation. Culture defines the basic organisational values and communicates to new members the correct ways to think and act and the ways things ought to be done. Culture enhances the stability of the organisation and helps members interpret organisational activities and events. The focus of culture is to provide members with a sense of identity and to generate within them a commitment to the beliefs and values of the organisation.

Cherrington (1994:55) further states that organisational culture consists of the shared beliefs about how things are done and what is important and that it is a process by which culture is created and transmitted through stories, legends and myths. Other authors define organisational culture slightly different, as presented in Table 2.1.

TABLE 2.1: DEFINITIONS OF ORGANISATIONAL CULTURE

Author	Definitions
Spender (1983:2)	Organisational culture is a belief system shared by an organisation's members.
O'Reilly (1983:1)	Organisational culture is strong, widely-shared core values.
Deal and Kennedy (1982:4)	Organisational culture is the way we do things around here.
Hofstede (1980:25)	Organisational culture is the collective programming of the mind.
Van Maalen and Barley (1985:31)	Organisational culture is collective understandings.
Peters and Waterman (1982:103)	Organisational culture is a dominant and coherent set of shared values conveyed by such symbolic means as stories, myths, legends, slogans, anecdotes and fairy tales.
Moorhead and Griffin (1995:444)	Organisational culture is the set of values, often taken for granted that help people in an organisation understand which actions are considered acceptable and which are considered unacceptable. These values are often communicated through stories and other symbolic means.
Schein (1992:12)	Organisational culture is the pattern of basic assumptions that a given group has invented, discovered or developed in learning to cope with its problems of external adaptation and internal integration.

Schein (1992:12) expanded on his definition for organisational culture and states that "those things that worked well enough to be considered valid should be taught to new members as the correct way to perceive, think and feel in relation to those problems".

According to Morris (1992:28) organisational culture may be a double-edged sword, which may be an advantage or a disadvantage for an organisation or its competitors. An organisation's culture must be developed and utilised in an effective and long-term manner to assist the employees within the organisation in working together to accomplish their assigned tasks and objectives. However, some organisational cultures may place roadblocks in the actions or thought processes of the employees. As a result, strategic moves may be improperly made or lost, or a series of day-to-day decisions may be slowed or delayed. The short or the long-term results may place the organisation at an organisational and/or competitive disadvantage.

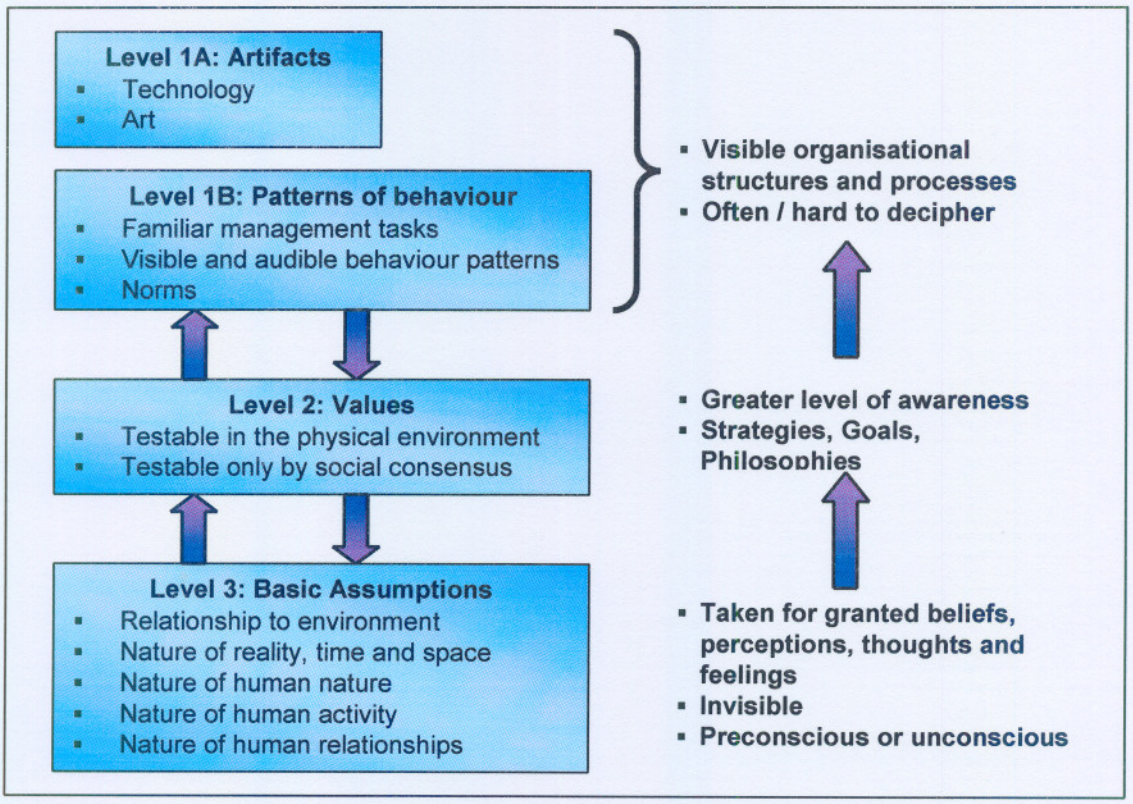
Cooper (2000:112) further states that although an organisation may possess a dominating 'cultural theme', there are likely to be a number of variations in the way in which the theme is expressed throughout the organisation. For example, one department may put health and safety before production, whereas another department may put production before health and safety. In the former, risk assessments may always be conducted prior to starting every job, while in the latter, people circumvent all the safety rules and procedures to ensure continuation of production. It follows, therefore, that several different sub-cultures will emerge from, or from around, functional groups, hierarchy levels and organisational roles, with very few behaviours, beliefs, attitudes or values being commonly shared by the whole of the organisation's membership. In turn, these sub-cultures may either be in alignment, or at odds, with the dominating 'cultural' theme. It is further argued that differing sub-cultures actually serve a useful function, as they are a valuable resource for dealing with collective ignorance determined by systematic uncertainty because they provide a diversity of perspectives and interpretation of emerging (health and safety) problems.

2.3.1 Elements of Organisational Culture

Schein (1992:16) explains that some of the confusion that arises through all the definitions of what organisational culture is, results from not differentiating the levels at which it manifests itself. He thus analysed culture at several different levels, where the term level refers to the degree to which the cultural phenomenon is visible to the observer. The levels at which culture can be analysed are shown in Figure 2.1.

FIGURE 2.1: LEVELS OF ORGANISATIONAL CULTURE AND THEIR INTERACTION

Adapted from: Organisational Culture and Leadership (Schein, 1992:17).



The levels consist of artifacts (Level 1), values and beliefs (Level 2) and basic underlying assumptions (Level 3).

Level 1

It refers to artifacts as the behavioural patterns and the visible, tangible or audible results of behaviours. Level 1A of organisational culture includes an organisation's written and spoken language and jargon, office lay-outs and arrangements, organisational structure, dress codes, technology and behavioural norms. Subsequent to this level is a sub-level, called 1B which represents patterns of behaviour, which includes elements such as habits, patterns of behaviour, norms, rites and rituals (Schein, 1992:17).

Level 2

It consists of beliefs and values, which are the sense of "what ought to be" as distinct from "what is". Level 2 reveals how people communicate, explain, rationalise and justify what they say and do as a community — how they make sense of the first level of culture. Level 2 includes ethos, philosophies, ideologies, ethical and moral codes and attitudes (Schein, 1992:19).

Level 3

It refers to the basic assumptions as fundamental beliefs, values and perceptions that have become so taken for granted that one finds little variation within a cultural unit. These basic underlying assumptions are distinct from preferred solutions — "what should be" — in the sense of dominant values. Level 3 elements of organisational culture include spirit, truths and possibly the transactional analysis concept of organisational scripts, but only if they are so completely accepted and deeply ingrained that they have moved into the organisation members' preconscious or unconscious (Schein, 1992:21).

Ott (1989:63) used these elements of organisational culture to create a typology in an effort to increase understanding of organisational culture. This typology can be used by managers to match his or her reasons for changing an organisational culture with the lenses for seeing it and the tools for changing it. The typology can also be used to match alternative methods for changing or reinforcing an organisational culture with the purpose for change.

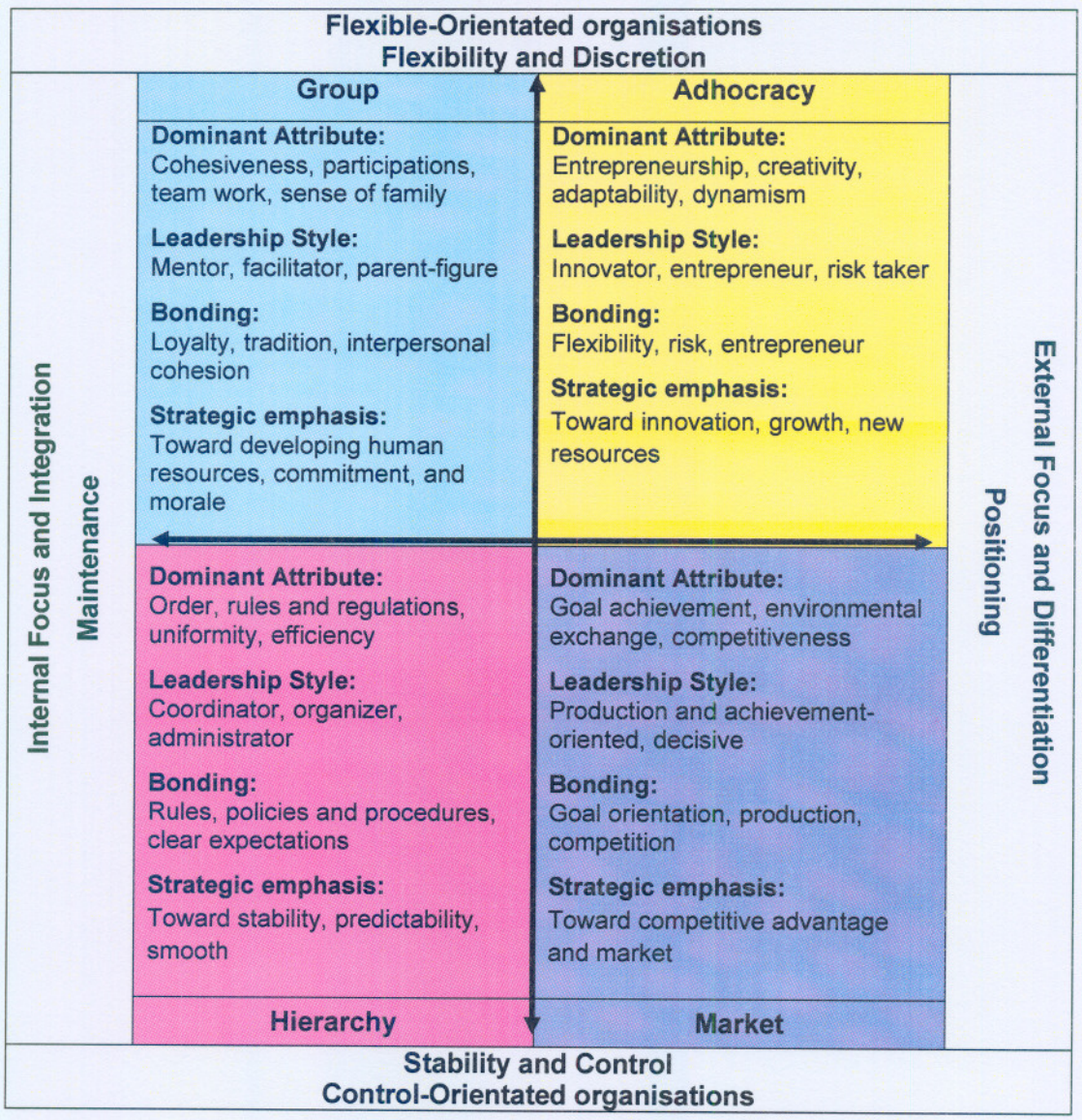
Level 1 should be used when there is a need for rapid, tangible, demonstrable, organisational changes such as doubling productivity levels. Level 2 and/or 3 should be used when one needs to understand and predict an organisation's long-term policy or strategic decision patterns.

2.3.2 A Model for Organisational Culture

Dellana and Hauser (1999:11) provide a competing values model (CVM) of organisational culture to explain the differences in the values underlying various organisational effectiveness models. Figure 2.2 represents this model.

FIGURE 2.2: THE COMPETING VALUES MODEL AND APPROACH TO CULTURE

Adapted from: Toward defining the quality culture (Dellana & Hauser (1999:12) and Organisational Development & Change (Cummings & Worley, 2005:488).



The model consists of two axes that reflect different value orientations. The vertical axis is the flexibility-control dimension that reflects organisational preferences toward structuring. Flexibility-oriented organisations support decentralisation and differentiation, while control-oriented organisations support centralisation and integration. The horizontal axis is the internal-external dimension. Internally-focused organisations emphasise maintenance of the existing system while externally-focused organisations seek improvements in competitive position by tracking environmental change. The four quadrants formed by the intersection of the two axes form the **four culture types**: group, adhocracy, rational and hierarchical.

The first culture type, **group**, is based on the values and norms associated with affiliation. Organisational members' compliance with organisational directives flows from trust, tradition and long-term commitment. It emphasises human resource development and values, member participation in decision-making. The strategic orientation associated with this cultural type is one of implementation through consensus building.

The second culture type, **adhocracy**, emphasises change. It employs a prospector type strategy in which growth and resource acquisition are stressed. The importance or ideological appeal of the task motivates organisational members.

The third culture type, **hierarchical**, has the values and norms associated with a bureaucracy. It values stability and assumes individuals will comply with organisational mandates when roles are formally stated and enforced through rules and procedures.

The fourth culture type, **market**, has a strategic emphasis toward competitive advantage and market superiority. Its primary objectives are productivity, planning and efficiency. Organisational members are motivated by the belief that performance, which leads to the desired organisational objectives, will be rewarded.

2.3.3 Changing Organisational Culture

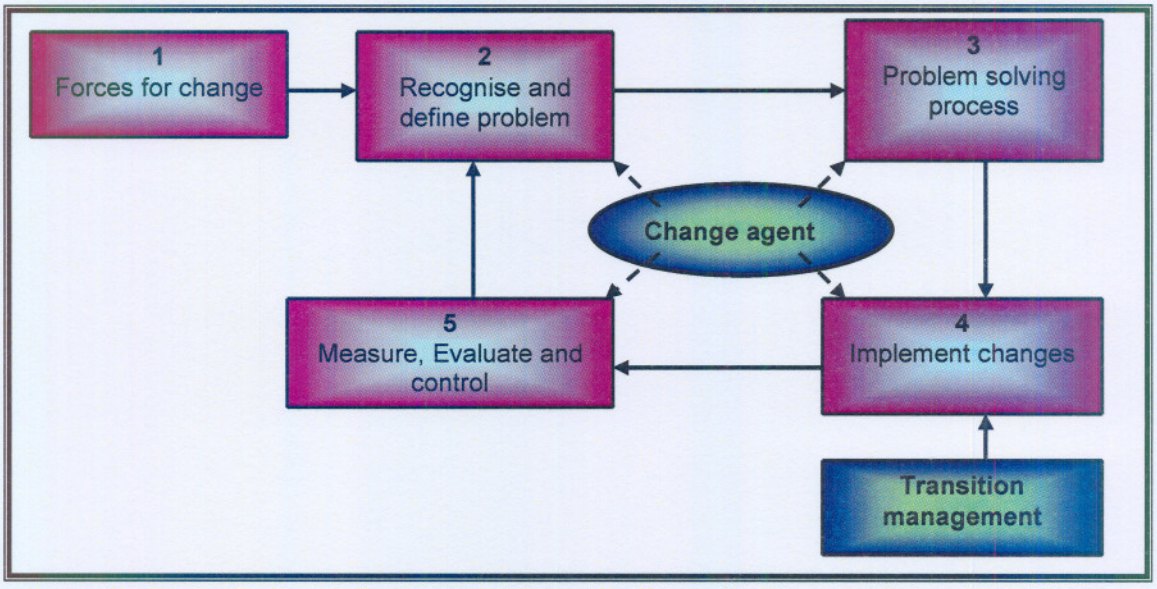
Cummings and Worley (2005:489) argue that there is considerable debate over whether changing something as deep-seated as organisational culture is possible. Those advocating culture change generally focus on the more superficial elements of culture, such as norms and artifacts. These elements are more changeable than the deeper elements of values and basic assumptions. Some might argue that unless the deeper values and assumptions are changed, organisations have not really changed its culture. Cultural change is an extremely difficult and long-term process.

Change requires time, and many of the expected financial and organisational benefits from change lag behind its implementation. Successful organisational change requires persistent leadership that does not waver unnecessarily (Cummings & Worley, 2005:173).

Moorhead and Griffin (1995:471) suggest that change should be planned and incorporated in the organisational strategy. Due to the dynamic nature of change, Moorhead and Griffin (1995:473) propose a continuous change process model (CCPM) approach; refer to Figure 2.3. This approach looks at planned change from the perspective of top management and indicates that change is continuous. In this approach, top management perceives that certain forces or trends call for change and the issue is subjected to the organisation's usual problem- solving and decision-making processes. Usually, top management defines its goals in terms of what the organisation or certain processes or outputs will be like after the change. Alternatives for change are generated and evaluated upon which an acceptable alternative is selected.

FIGURE 2.3: CONTINUOUS CHANGE PROCESS OF ORGANISATIONAL CHANGE

Adapted from: Organisational Behaviour: Managing People and Organisations (Moorhead & Griffin (1995:473).



To facilitate change, a change agent is appointed early in the process (Moorhead & Griffin, 1995:473). The primary objective of the change agent is to manage the change effort. The change agent may help management to recognise and define the problem or the need for change as well as be involved in generating and evaluating potential plans of action. The change agent may be a member of the organisation or an outsider such as a consultant or even someone from head office whom employees view as an outsider. An internal change agent is likely to know the organisation's people, tasks and political situations, which may be helpful in interpreting data and understanding the system. An insider may also be too close to the situation to view objectively.

Top management and the change agent measure, evaluate and control the degree to which the change is having the desired effect. The more closely the change agent is involved in the change process, the less distinct the steps become. As the change agent becomes immersed in defining and solving the problem with members of the organisation, he or she becomes a

"collaborator to the organisation". When this happens, the change agent may be working with many individuals, groups and departments within the organisation on different phases of the change process. Throughout the process the change agent brings in new ideas and viewpoints that help members look at old problems in new ways. Change often comes from conflict that results when the change agent challenges the organisation's assumptions and generally accepted patterns of operation (Moorhead & Griffin, 1995:474).

Moorhead and Griffin (1995:474) define transition management as the process of systematically planning, organising and implementing change, from the disassembly of the current state to the realisation of a fully functional state within an organisation. Once change begins, the organisation is in neither the old state nor the new state — yet business must continue. Transition management ensures that business continues during the change and thus it must begin before the change occurs. Members of the regular management team must take on the role of transition managers and co-ordinate organisational activities with the change agent. Communication of the changes to all involved, including employees, customers and suppliers play an important role in transition management.

Kotter and Heskett (1992:3) found that in all cases of successful cultural change corporate leaders completed each stage of the change procedure in a specific sequence before moving on to the next stage. These stages include: initial culture, aberrant behaviour, new leadership, new vision, reorganisations and successful culture change.

Stacey (2000:123) lists the sequence of activities that must be followed by change agents or consultants:

- Establish a top client group consisting of the most senior and politically powerful executives. The client and the consultant identify what changes need to be brought about.

- Executives might start the process by going away for a weekend to put together a mission statement setting out what new key values are to drive the business.
- "Roll down" the mission statement throughout the organisation by forming another level consisting of senior managers. The senior managers must translate the mission statement into a mission for their respective levels.
- Establish teams of managers for different business levels to translate the respective mission statement into their own business units or functions.
- As the programmes of meetings continue, members would spend time identifying how to turn the missions into more precise objectives and what plans to prepare to achieve these objectives.

According to Kreitner and Kinicki (2001:667), John Kotter believes that organisational change typically fails because senior management commits one or more of the following errors:

- Failure to establish a sense of urgency about the need for change.
- Failure to create a powerful-enough guiding coalition that is responsible for leading and managing the change process.
- Failure to establish a vision that guides the change process.
- Failure to effectively communicate the new vision.
- Failure to remove obstacles that impede the accomplishment of the new vision.
- Failure to systematically plan for and create short-term wins. Short-term wins represent the achievement of important results or goals.
- Declaration of victory too soon. This derails the long-term changes in infrastructure that are frequently needed to achieve a vision.
- Failure to anchor the changes into the organisation's culture. It takes years for long-term changes to be embedded within an organisation's culture.

Kotter's research reveals that successful organisational change is 70% to 90% leadership and only 10% to 30% management (Kreitner & Kinicki, 2001:668).

2.3.4 Managing Organisational Culture

Moorhead and Griffin (1995:456) state that managing organisational change requires attention given to three factors:

- Firstly, managers can take advantage of cultural values that already exist and use their knowledge to help subordinates understand them.
- Secondly, employees need to be properly socialised, or trained, in the cultural values of the organisation, either through formal training or by experiencing and observing actions of higher-level managers.
- Thirdly, managers can change the culture of the organisation through managing symbols, dealing with the extreme difficulties of change and relying on the permanence of the new organisation culture once the change has been implemented.

Alvesson (2002:174) states that "managing culture" is often equated with "changing culture". Culture is then frequently focused because existing ideas, beliefs, values and meanings are viewed as problematic and need to be transformed. Alvesson argues that this change may be exaggerated. Alvesson states that there is a lot of talk in the mass media and the literature about drastic changes taking place at an accelerating speed due to:

- Reports on the knowledge society.
- The new economy.
- The significance of e-commerce.
- Rapidly changing tastes of customers.
- Increasing global competition.
- The young generation being very different from the previous one, etc.

This seems to imply a pressure for rapid changes. Alvesson mentions a study which were conducted of 448 European firms during 1992 — 1996 which indicated that some changes took place in terms of some degree of delayering, more decentralised operational decision-making and increased internal networking. However, these changes were modest, not radical. There are times when a radical large-scale change are called for and does take place.

Kurt Lewin popularised the refrigerator-model (Kreitner & Kinicki, 2001:664) where he suggests three stages of intentional change i.e. unfreezing, change and refreezing. Lewin imagines a frozen, i.e. fixed social world, which can be heated up and then frozen again at will, through a correct intervention. The world is constantly in change and this model may be misleading.

Change is the only constant as we live in a dynamic world where employees quit and are replaced, old customers leave and new ones enter the organisation. Thus, this change must be managed as organisations are part of a continuously changing social world and any effort to modify cultural orientations calls for a sense of these ongoing cultural changes (Viljoen, 2003:25).

Alvesson (2002:177) argues that managers must maintain culture to ensure that when there is a drift from ideas, values and meaning that was perceived as an earlier and more positive state to restore the situation. Cultural maintenance is an integral part of most everyday activities, talk and structural arrangements in organisations. Sometimes managers may systematically be oriented towards, for example:

- Upholding virtues and morale and encouraging the continued dominance of a particular set of meanings informing how people perceive and relate to a specific issue.

- Supporting organisational and departmental identity in order to maintain distinctiveness from other organisations.
- Creating a cultural basis for image management where cultural maintenance is directed towards recreating an internal basis for what is signalled as the organisation's image or profile to external groups.

Organisational change needs to be transformed sometimes and for these radical change efforts, Alvesson (2002:178) suggests a six-step process, which consists of:

Step I - evaluating the situation of the organisation and determining the goals and strategic direction.
Step 2 - analysing the existing culture and sketching a desired culture.
Step 3 - analysing the gap between what exists and what is desired.
Step 4 - developing a plan for developing a culture.
Step 5 - implementing the plan.
Step 6 - evaluating the changes, making new efforts to go further and/or engaging in measures to sustain the cultural change.

Alvesson (2002:178) provides some common means to managers for accomplishing cultural change as a combination of the following ingredients:

- New recruitment and selection procedures so that people expected to be supportive of a desired culture will be hired. Sometimes this is combined with laying-off and/or replacing people perceived as not being of "true grit".
- New forms of socialisation and training programmes to signal the desired values and beliefs.
- Performance appraisal systems in which the culturally correct ways of being and behaving are rewarded and encouraged.
- Promotion of people expressing and symbolising the desired culture.

- Leadership that communicates cultural values in talk, actions and material arrangements, e.g. vision talk and for-public-consumption acts by the top manager.
- The use of organisational symbols — particular use of language (slogans, expressions, stones), actions (use of meetings in a ritual way, the visible use of managers' time to signal what is important) and material objects (corporate architecture, logotype, dress code).

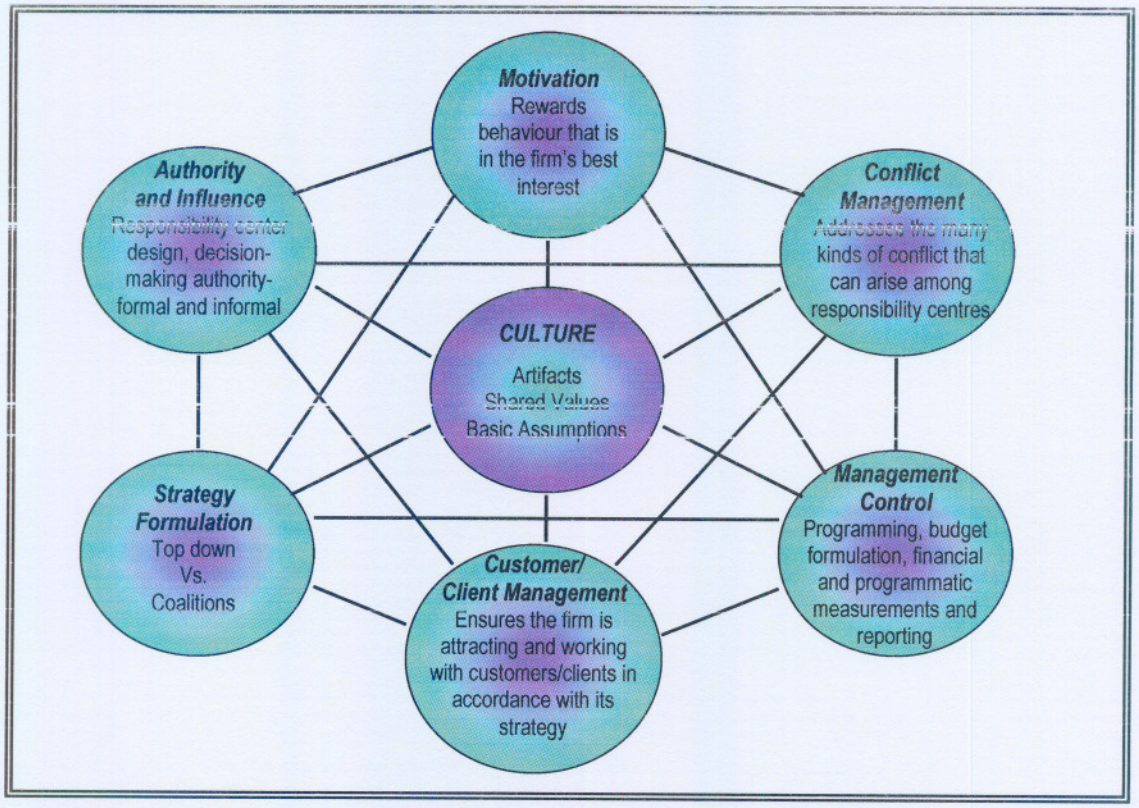
Young (2000:20) identifies six levers for managing organisational culture that can be used by managers to either maintain or modify the existing culture. The six levers are:

- **Strategy formulation** — relates to the way a firm defines itself and its overall direction.
- **Authority and influence** — identifying key decision makers according to the organisational structure.
- **Motivation** — acknowledging the different ways to motivate different levels within the organisation and adapt the existing reward system to support motivation.
- **Management control** — which consists of programming, budgeting, measuring and reporting and all being aligned with corporate strategy.
- **Conflict management** — ensuring that conflict is beneficial to the change process and not detrimental.
- **Customer management** — including operations management and marketing to benefit product design, manufacturing, service provision, scheduling, price setting and the delivery of after-sale services.

In some instances, the use of one of these processes as a cultural level is relatively easy; in others it is quite complex and difficult. It is important to note, that as the lines in Figure 2.4 indicate, all six levers must fit together in such a way that they are mutually reinforcing.

FIGURE 2.4: LINKAGES AMONG CULTURE AND THE SIX ORGANISATIONAL LEVERS

Adapted from: The six levers for managing Organisational Culture (Young, 2000:20).



Managers can use these six levers to maintain or transform a firm's culture. It is important for managers to realise that these six levers are interlinked and that they use them in combination with each other so as to influence organisational culture (Young, 2000:27).

2.3.5 Measuring Organisational Culture

Ashkanasy *et al.* (2000:132) states that quantitative measurements of organisational culture is limited to observable and measurable manifestations of culture as represented by the shallower levels of Schein's typology. This also has the further implication that different levels of Schein's typology are amenable to a different research method. Thus, the appropriate means of assessment depends on the cultural level to be examined. The

shallower layers of culture are more explicit and can be appropriately studied using a structured and quantitative approach.

Quantitative assessment of organisational culture has been criticised in the past because of a strong mono-method bias in the field, according to Martin as reviewed by Ashkanasy *et al.* (2000:132). The emphasis is placed on higher abstractions of organisational culture, coupled with researchers' perceiving "either/or" choices among methods nearly to the exclusion of quantitative techniques. Although Martin argues for a need to include qualitative data in culture studies, the essence of her case is that there is a need for a multilevel and multi-method conceptualisation. Schein's three-level typology, according to Ashkanasy *et al.* (2000:132), provides a distinctive role for both quantitative and qualitative measurement. It is generally agreed that surveys represent an efficient and standardised means of tapping the shallower levels of Schein's typology. The deepest level of culture, on the other hand, can be investigated only through more intensive observation, focused interviews and the involvement of organisational members in self-analysis. The thrust of this argument is that there is a clear and continuing role for quantitative measures as a means of assessing the less abstract levels of organisational culture.

Ashkanasy *et al.* (2000:133) also states that survey methods have characteristics that render them especially useful for organisational culture research. Self-report surveys allow respondents to record their own perceptions of reality. Behaviour and attitudes are determined not by objective reality, but by actor's perceptions of reality and it is therefore appropriate to focus on perceptions rather than on reality.

2.4 HEALTH AND SAFETY CULTURE

2.4.1 The concept of Health and Safety Culture

Cooper (2000:113) stated that the term "safety culture" first made its appearance in the 1987 OECD Nuclear Agency report (INSAG, 1988) on the 1986 Chernobyl disaster. Gaining international currency over the last decade, it is loosely used to describe the corporate atmosphere or culture in which health and safety is understood to be, and is accepted as, the number one priority. Unless health and safety is ***the*** dominating characteristic of corporate culture, which arguable it should be in high-risk industries, health and safety culture is a sub-component of corporate culture, which alludes to individual, job, and organisational features that affect and influence health and safety. A health and safety culture does not operate in a vacuum; it affects, and in turn is affected by, other non-health and safety-related operational processes or organisational systems, i.e. downsizing or organisational restructuring.

2.4.2 Defining Health and Safety Culture

According to Wiegmann *et al.* (2004:121) recent reviews in literature revealed several diverse definitions of the safety culture concept. These various definitions as adopted from Wiegmann *et al.* (2004:122-123) are presented in Table 2.2.

TABLE 2.2: DEFINITIONS OF SAFETY CULTURE

Source / Industry	Definitions
Carroll (1998: nuclear power, US)	Safety culture refers to a high value (priority) placed in worker safety and public (nuclear) safety by everyone in every group and at every level of the plant. It also refers to expectations that people will act to preserve and enhance safety, take personal responsibility for safety, and be rewarded consistently with these values.

Source / Industry	Definitions
Ciavarelli &Figlock (1996: naval aviation, US)	Safety culture is defined as the shared values, beliefs, assumptions, and norms that may govern organisational decision making, as well as individual and group attitudes about safety.
Cooper (2000: theoretical)	Safety culture is a sub facet of organisational culture that is thought to affect members' attitudes and behaviour in relation to an organisation's ongoing health and safety performance.
Cox & Cox (1991: industrial gases, European)	Safety culture reflects attitudes, beliefs, perceptions and values that employees share in relation to safety.
Cox & Flin (1998: theoretical)	The safety culture of an organisation is the product of individual and group values, attitudes, perceptions, competencies, and patterns of behaviour that determine the commitment to, and style and proficiency of an organisation's health and safety management.
Eliff (1999; aviation, US)	A safety culture exists within an organisation in which each individual employee, regardless of their position, assumes an active role in error prevention, and that role is supported by the organisation.
Flin, Means, Gordon & Fleming (1998; offshore oil and gas, UK)	Safety culture refers to entrenched attitudes and opinions that a group of people share with respect to safety. It is more stable (than safety climate) and resistant to change.
Helmreich & Merrit (1998; aviation, US)	Safety culture: A group of individuals guided in their behaviour by their joint belief in the importance of safety, and their shared understanding that every member willingly upholds the group's safety norms and will support other members to that common end.
McDonald & Ryn (1992; theoretical in context of road transportation) Means & Finn (1999; theoretical) Pidgeon & Oleary (1994; theoretical in context of aviation)	Safety culture is defined as the set of beliefs, norms, attitudes, roles, and social and technical practices that are concerned with minimizing the exposure of employees. Managers, customers and members of the public to conditions considered dangerous or injurious.
Mearns, Flin, Gordon & Fleming (1998; offshore oil and gas, UK)	Safety culture is defined as the attitudes, values, norms and beliefs that a particular group of people share with respect to risk and safety.
Meshkati (1997;	Safety culture is defined as that assembly of characteristics and

Source / Industry	Definitions
transportation industry, US)	attitudes in organisations and individuals that establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance.
Minerals Council of Australia (1999; mineral industry, Australia)	Safety culture refers to the formal safety issues in the company dealing with perceptions of management systems and perceptions of the organisation.
Pidgeon (2001; theoretical in context of driver behaviour)	A safety culture is in turn a set of assumptions and their associated practices that permits beliefs about danger and safety to be constructed.

Adapted from: Wiegmann *et al.* (2004:122-123).

Although various safety culture definitions from different industries were quoted in the table the commonalities among them yield a set of critical features regardless of the particular industry being considered. According to Wiegmann *et al.*, (2004:123) these commonalities include the following:

- Safety culture is a concept defined at the group level or higher that refers to the shared values among all the group or organisation members.
- Safety culture is concerned with formal safety issues in an organisation and closely related to, but not restricted to, the management and supervisory systems.
- Safety culture emphasizes the contribution from everyone at every level of the organisation.
- The safety culture of an organisation has an impact on its members' behaviour at work.
- Safety culture is usually reflected in the contingency between reward systems and safety performance.
- Safety culture is reflected in an organisation's willingness to develop and learn from errors, incidents and accidents.
- Safety culture is relatively enduring, stable and resistant to change.

Wiegmann *et al.* goes further and said that it should be noted that many of the listed definitions imply that an organisational safety culture exists on a continuum and the organisation can have either a good or poor safety culture. However, not all of the literature makes this assumption. Some have suggested that safety culture is either present of absent within the organisation. Nevertheless, it is clear from the initial introduction of the term within various operational environments that safety culture is assumed to be a component of an organisation that can be improved rather than simply instilled.

According to Lee (1993:21) a culture is more than the sum of its parts. It is everything that is acquired or learned in the way of perceptions, attitudes, norms, values, relationships, competencies and patterns of behaviour. Once cultivated, these are continuously transmitted to the next generation, so the culture transcends those who work in its organisation at any one time.

Mention to particular health in the culture definitions, is however not so extensively documented, but in essence the concept of safety addressed in the definitions includes to a greater extent the concept of a health culture.

2.4.3 Defining Health and Safety Climate

A similar term *health and safety climate* has been used frequently in the literature and has added to the confusion of what is a health and safety culture vs. a health and safety climate. To confuse the matter even further in studying the literature some definitions listed in Table 2.3 (adopted from Wiegmann *et al.* (2004:125)) for safety climate are almost identical to safety culture.

TABLE 2.3: DEFINITIONS OF SAFETY CLIMATE

Source / Industry	Definitions
BASI (1996: civil aviation, Australia)	The procedures and rules governing safety within an organisation is a reflection of its safety climate, which is centred on employees' perceptions of the importance of safety and how it is maintained within the workplace.
Cheyne, Cox, Oliver & Tomas (1998: manufacturing, UK & France)	Safety climate can be viewed as a temporal state measure of culture, which is reflected in the shared perceptions of the organisation at a discrete point in time.
Dedobbeleer & Beland (1999: construction, US)	Safety climate is viewed as an individual attribute, which is composed of two factors: management's commitment to safety and workers' involvement in safety.
Flin, Means, Gordon & Fleming (1998; offshore oil and gas, UK)	Safety climate refers to the perceived state of safety of a particular place at a particular time. It is therefore relatively unstable and subject to change depending on features of the operating environment.
Flin, Means, O'Connor & Bryan (1998; review of various industries, only one aviation related study)	Safety climate is the surface features of the safety culture discerned from the workforce's attitudes and perceptions at a given point in time.
Griffin & Neal (2000; manufacturing and Mining, Australia)	Safety climate should be conceptualized as a higher order factor comprised of more specific first-order factors. First-order factors of safety climate should reflect perceptions of safety-related policies, procedures, and rewards. The higher order factor of safety climate should reflect the extent to which employees believe that safety is valued within the organisation.
Hofmann & Stezer (1996; utilities, US)	Safety climate is operationalised as perceptions regarding management's commitment to safety and worker involvement in safety related activities.
Mearns, Whitaker, Flin, Gordon & O'Connor (2000; offshore oil, UK)	Safety climate is defined as a "snapshot" of employees' perception of the current environment or prevailing conditions that impact on safety.
Minerals Council of Australia (1999; minerals, Australia)	Safety climate refers to the more intangible issues in the company such as perceptions of safety systems, job factors, and individual factors.
Yule, Flin & Murdy (2001;	Safety climate is defined as the product of employee perception

Source / Industry	Definitions
conventional power, UK)	and attitudes about the current state of safety initiatives at their place of work.
Zohar (1980; manufacturing, including metal, food, chemical and textile, Isreal)	Safety climate is a particular type of organisational climate that reflects employees' perceptions about the relative importance of safe conduct in their occupational behaviour. It can vary from highly positive to a neutral level, and its average level reflects the safety climate in a given company.
Zohar (2000; manufacturing, Isreal)	Group level safety climate refers to shared perceptions among group members with regard to supervisory practices.

Adapted from: Wiegmann *et al.* (2004:125).

As indicated in Table 2.3 many definitions do have commonalities and do differ from safety culture in important ways. Wiegmann *et al.* (2004:124) lists these as follows:

- Safety climate is a psychological phenomenon that is usually as the perceptions of the state of safety at a particular time.
- Safety climate is closely concerned with intangible issues such as situational and environmental factors.
- Safety climate is a temporal phenomenon, a "snapshot" of safety culture, relatively unstable and subject to change.

2.4.4 Health and Safety culture versus Climate

According to Wiegmann *et al.* (2004:124) **health and safety culture**, as defined in literature, is commonly viewed as an **enduring characteristic** of an organisation that is **reflected in its consistent way of dealing with critical health and safety issues**.

On the other hand **health and safety climate** is viewed as a **temporary state** of an organisation that is **subject to change** depending on the features of the specific operational or economic circumstances.

2.4.5 Organisational indicators of Health and Safety Culture

After studying the numerous health and safety culture definitions in literature Wiegmann *et al.* concluded that there are at least five global components or indicators of a health and safety culture. These include organisational commitment, management involvement, employee empowerment, reward systems and reporting systems.

- **Organisational commitment**

  An organisation's upper level management has long been recognised as playing a critical role in promoting organisational health and safety culture (Yule *et al.*, 2001). Organisational commitment to health and safety refers to the extent to which upper management identifies safety as a core or guiding principle of the organisation. Therefore commitment is reflected in the ability of its upper level management to demonstrate an enduring, positive attitude toward safety, even in times of fiscal austerity, and to actively promote safety in a consistent manner across all levels within the organisation. When upper level management is committed to safety, it provides adequate resources and consistently supports the development and implementation of safety activities (Eliff, 1999: 1). An organisation's commitment to health and safety is therefore ultimately reflected by the efforts put forth to ensure that every aspect of its operations are routinely evaluated and, if necessary, modified to ensure continuous improvement.

- **Management involvement**

  According to Eliff (1999:5) both upper and middle-level management communicate, through participation in the day-to-day operations, to their employees an attitude of concern for health and safety that subsequently influences the degree to which employees comply with operating rules and with safe operating practises. Management involvement in health and safety is therefore reflected by managers'

presence and contribution to health and safety seminars and training, their active oversight of these critical operations, their ability to 'stay in touch" with the risks involved in everyday operations, and the extent to which there is good communication about health and safety issues both up and down the organisational hierarchy (Wiegmann *et al.*, 2004:127).

- **Employee empowerment**

  Organisations with "good" health and safety culture empower its frontline managers / employees and ensure that they clearly understand their critical role in promoting health and safety. Empowerment, in this context, specifically refers to an individual's perceptions or attitudes as a result of a delegation of authority or responsibility by upper management. An empowered attitude can lead to increased motivation to "make a difference", to go beyond the call of duty for organisational health and safety and take responsibility for ensuring healthy and safe operations at all times (Geller, 1994: 19). Wiegmann *et al.* (2004:127) states that within the context of a health and safety culture, employee empowerment means that employees have:

  - A substantial voice in health and safety decisions.
  - The leverage to initiate and achieve health and safety improvements.
  - Hold themselves and others accountable for their action.
  - Take pride in the health and safety record of their organisation.

- **Reward systems**

  One of the key components of an organisation's health and safety culture is the manner in which both safe and unsafe behaviour is evaluated and the consistency in which rewards or penalties are doled out according to these evaluations. A fair evaluation and reward system is needed to promote health and safe behaviour and discourage or correct unsafe behaviour (Eliff, 1999:10). An organisation's health and safety culture, therefore, is reflected by the extent to which it possesses

an established system for reinforcing health and safe behaviours (e.g. through monetary incentives or public praise and recognition by management and peers) as well as systems that discourage or punish unnecessary risk taking and unsafe behaviours. However, an organisation's health and safety culture is signified not only by the existence of such reward systems but also by the extent to which the reward systems are formally documented, consistently applied, and thoroughly explained and understood by all its employees (Wiegmann *et al.*, 2004:127).

- **Reporting systems**

  "One of the foundations of a true health and safety culture is that it is a reporting culture" (Eliff, 1999: 17). Wiegmann *et al.* (2004:127) states that an organisation with a good health and safety culture should have a formal reporting system in place and one that is actually used comfortably by its employees. A good reporting system allows and encourages employees to report health and safety problems, and it also provides timely and valuable feedback to all employees.

2.4.6 Health and Safety culture model

Cooper (2000: 117) states that organisations have often attempted to change people's attitudes without considering either job or organisational features. Similarly, changes are often made to organisational systems without regard to people's behaviours or attitudes. The findings listed in literature suggest that change initiatives that disregard the interactive relationship between psychological, behavioural and situational factors when developing a health and safety culture are doomed to failure.

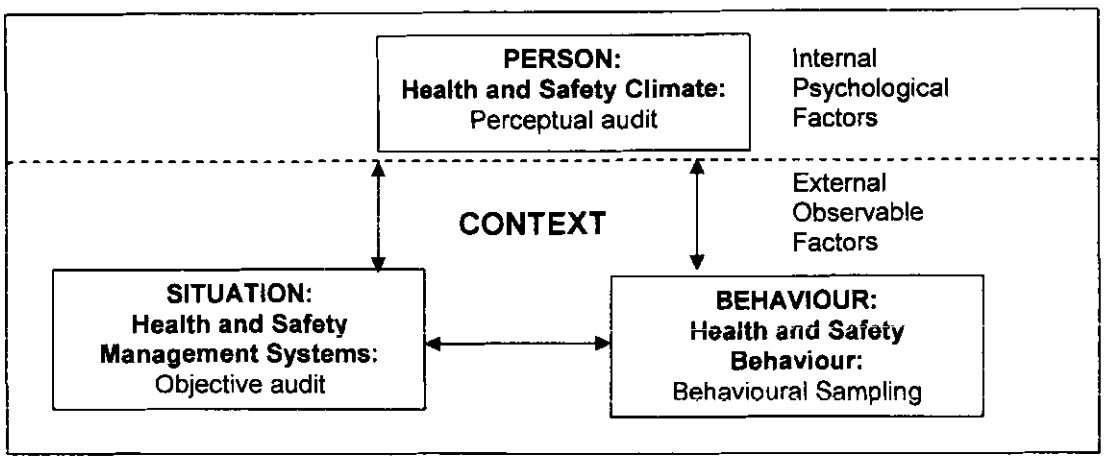
A literature search reveals that very few models of organisational (health and safety) culture exist. Those that do, tend to be adaptations of a three layer cultural model that assesses:

- Core underlying assumptions.

- Espoused beliefs and values.
- Behaviours and artifacts (Cooper, 2000: 117).

Cooper (2000: 120) adapted Bandura's (1977, 1986) model of reciprocal determination to reflect the concept of health and safety culture. It contains three elements which encompass subjective internal psychological factors, observable ongoing health and safety-related behaviours and objective situational features (Figure 2.5).

FIGURE 2.5: RECIPROCAL SAFETY CULTURE MODEL
Adapted from: Towards a model of safety culture (COOPER, 2000:120).



In this adaptation, the internal psychological factors (i.e. attitudes and perceptions) are assessed via health and safety climate questionnaires. Actual ongoing health and safety related behaviour is assessed via checklists as part of behavioural health and safety initiatives, while the situational features are assessed via health and safety management system audits/ inspections. The reciprocal model provides an integrative way of thinking about the many processes that impact on health and safety culture. It also provides a triangulated set of measurement instruments that are not solely dependant upon incident or accident indices and a dynamic framework that provides the means with which to conduct multi-level analyses of the health

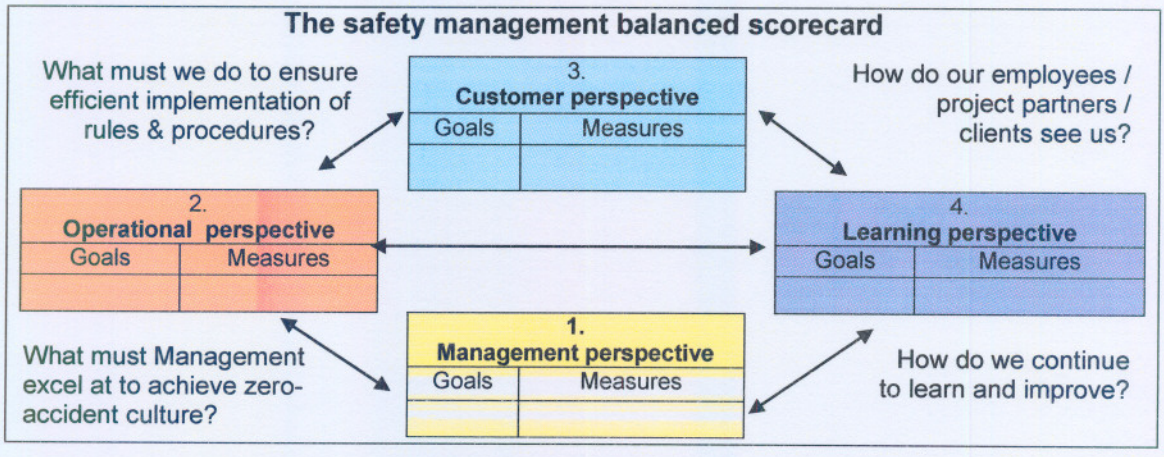
and safety culture construct to identify where cause-effect relationships do and do not exist (Cooper, 2000: 120).

At times organisations must be able to demonstrate a 'flexible culture' to reconfigure itself in the light of certain kinds of dangers, which in turn will thus require a 'learning culture'. In other words, an informed culture also (equivalent to a health and safety culture) comprises of many types of situational specific cultures (not all of which are health and safety related), which interact with each other to create an 'informed culture'. Although underspecified in many respects, the model appears to represent a goal-setting paradigm, in that to engineer a health and safety culture (super-ordinate goal) it has to be broken down into a series of sub-goals i.e. develop reporting, just, flexible and learning cultures (Cooper, 2000: 123).

2.4.7 Assessing Health and Safety Culture

The literature suggests that a health and safety culture could be measured through a health and safety balanced scorecard. To effectively develop such a balanced scorecard for health and safety, the four traditional perspectives, as defined by Kaplan and Norton (1992), should be put in a different light as shown in Figure 2.6 (Mohamed, 2003:48).

FIGURE 2.6: THE SAFETY MANAGEMENT BALANCED SCORECARD
Adapted from: Adaptation of the balanced scorecard to measure organisational safety culture (Mohamed, 2003:48).



Management's commitment and involvement in health and safety is the factor of most importance for a satisfactory health and safety level. This strategic perspective concerns with the overall strategic objectives of achieving a zero-accident culture and should represent a top-down driven strategy on health and safety, as part of an organisation's overall strategy for business. As such, goals in this perspective should reflect business, procurement, human resource management and finance strategies. This multitude of strategies, in combination or alone, influences health and safety performance levels, be it voluntarily or involuntary. It is essential therefore that there is coherence between these strategies, so that employees receive a consistent message on health and safety as a strategic issue (Mohamed, 2003:49).

Operational perspective – A successful health and safety system program is based on the premise that health and safety is both a management responsibility and a line function. While top management helps formulate the health and safety policy, its actual success depends upon the ability of site management and supervisory personnel to insure that rules and policies are adhered to during daily operation. Consequently, this perspective concerns with the efficient implementation of health and safety rules and procedures on site. It also encompasses the ability to address specific project objectives in relation to health and safety, appraisal of physical work environment and workers' constructive involvement (Mohamed, 2003:50). **Goals** in this perspective should include a higher degree of compliance, a higher level of workforce pro-activeness, more efficient site layout planning, efficient communication / feedback systems, safer workplaces and better worker-supervisor's relationships (Mohamed, 2003:51).

The **customer perspective** advocated should incorporate measures to capture how internal as well as external customers perceive the endeavours to achieve a zero-accident culture, as being promoted by the organisation.

Ideally, these measures should show all those involved how the health and safety culture is performing and foster incentives to work together (management, employees, clients and project partners). This perspective represents the product of the health and safety culture. Mohamed explains further that the health and safety culture within the organisation must be a philosophy, not just a set of guiding rules and procedures. Goals in this perspective should mainly focus on safety climate on sites. Descriptive measure would be chosen to capture clients' as well as employees' opinion reflecting their perception of, and attitudes towards, health and safety within organisational atmosphere at a given point in time (Mohamed, 2003:51).

The **learning perspective** reflects how the organisation should continue to learn and improve, with the focus herein on the future as opposed to current health and safety performance levels. It is in this perspective, that organisations should incorporate human resource management measures, thereby recognising that people are true drivers of learning and improvement.

From an organisational development point of view, self-report measures offer internal credibility to organisational members, which is likely to increase the likelihood that members will accept the results of the survey. Other advantages of survey assessment and of quantification techniques are:

- Allowing replication and cross-sectional comparative studies.
- Providing an accepted frame of reference for interpreting data.
- Helping the evaluation and initiation of culture change efforts in organisations.
- Providing data that can be analysed through multivariate statistical techniques.

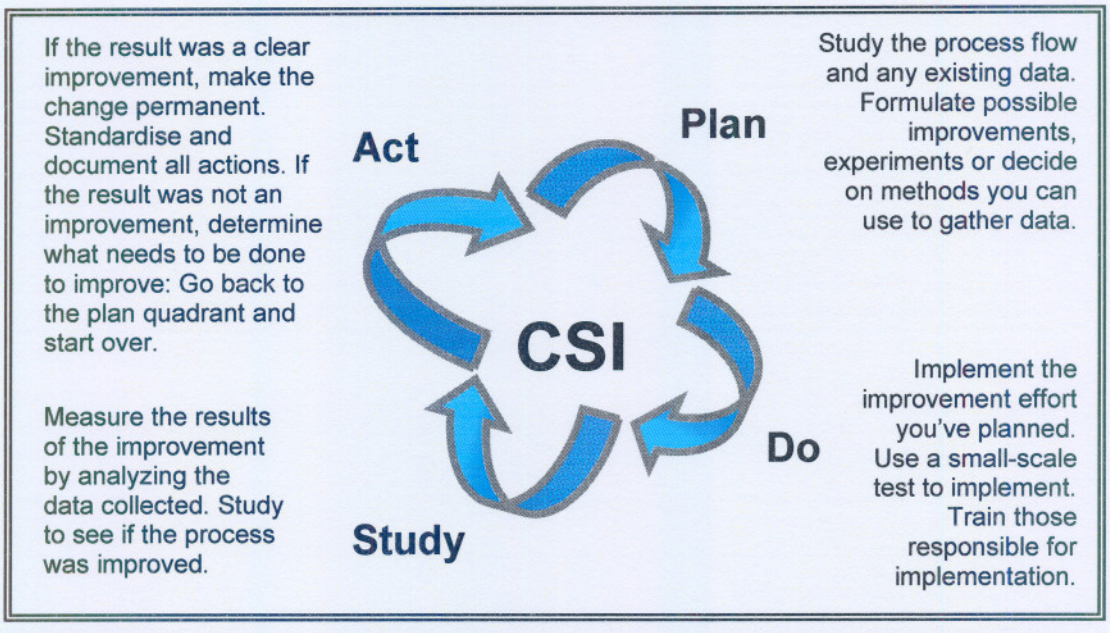
2.5 CONTINUOUS IMPROVEMENT STRATEGY

Quality leadership demands continuous improvement in both the product or service, and the process that produces it (Anon$_c$., 2004).

2.5.1 Defining continuous improvement

The Shewhart Cycle defines Continuous Safety Improvement (CSI) as per Figure 2.7.

FIGURE 2.7: THE SHEWHART CYCLE
Adapted from: OR-OHSA 1110 (Anon$_c$., 2004).



It is argued that the CSI cycle consists of four main actions, namely; plan, do, study and act. The suggested loop should at all times be used as basis to evaluate any continuous improvement strategy, in order to identify those areas where further improvement is needed.

2.5.2 Drivers / strategies for continuous improvement

Cooper (2000: 115) argues that the question remains how much energy should a person expend to improve health and safety, and for how long in the

face of obstacles. It is self-evident that what constitutes the units of "effort" could differ in different organisations. Nonetheless, the degree to which employees consistently confront others about their unsafe acts, the degree to which employees report unsafe conditions, the speed with which employees implement remedial actions, the degree to which employees give priority to safety over production are all observable examples of employees directing their efforts to improve health and safety.

2.5.3 Building a Health and Safety Culture

Eckenfelder (2003:33) outlines the benefits organisations should achieve in employing a values-driven enrichment approach to health and safety and risk management. These include:

- **It predicts the future**. Usually companies apply performance measurement systems which are all retrospective. Measuring health and safety culture is prospective. It provides a much needed crystal ball.
- **It is culture–sensitive and adaptable**. The process of a values-driven culture can be adapted to any industry and any existing culture, by starting to assess the current culture, taking you from where you are to where you want to go.
- **It facilitates excellence**. The process provides a model and method and manages general organisational culture. It also increases efficiency. Hence, it facilitates excellence in several important ways.
- **It appeals to all employees**. The approach treats employees as adults and empowers them.
- **It only costs commitment.** There are no capital expenditures associated with health and safety culture enrichment and most of the time required is integrated into the normal management process.

- **It is enduring**. Unlike most"health and safety programs" like Behavioural Based Safety – which are ephemeral - when health and safety culture is enriched, it lasts.
- **It provides a template.** Once you have applied a values-driven approach to creating loss resistance, you have a "tool" with which to judge every future action and to review past actions.

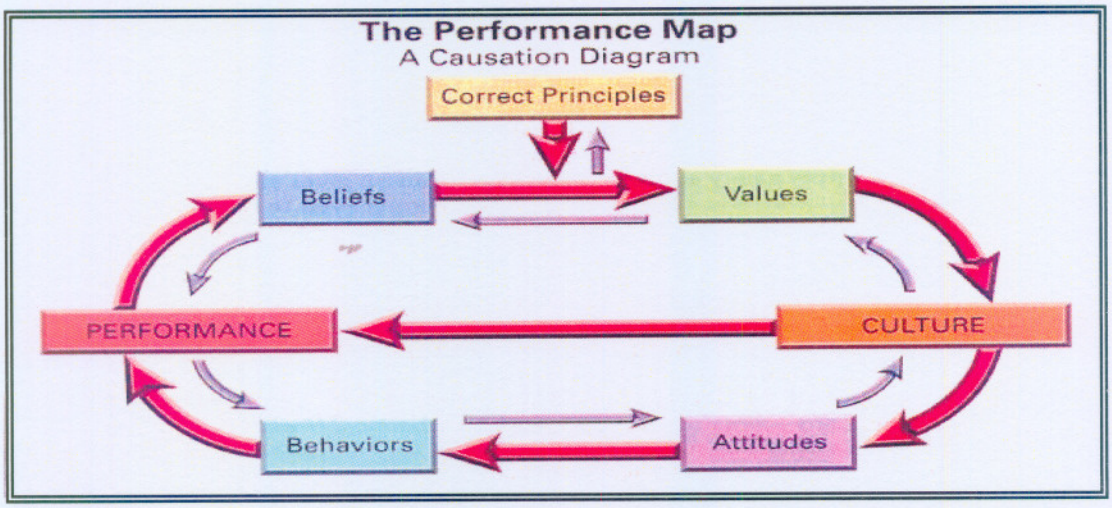
2.5.4 Cornerstones of a Health and Safety Culture

In order to harvest the above listed benefits, Eckenfelder (2003:34) argues the answer is rooted in an examination of the cornerstones of the values-driven enrichment process to health and safety and risk management, which are:

- The Performance Map.
- The Bridge Metaphor.
- The Health and Safety Culture Barometer.
- Exercising for Continuous Improvement.

1. **The Performance Map** is a causation diagram (Figure 2.8). It explains the relationship between culture and performance. It could be said to be the keystone concept of a values-driven approach to creating loss resistance in an organisation and facilitating every other aspect of the loss prevention effort.

FIGURE 2.8: THE PERFORMANCE MAP – A CAUSATION DIAGRAM
Adapted from: Getting the safety culture right (Eckenfelder, 2003:32).

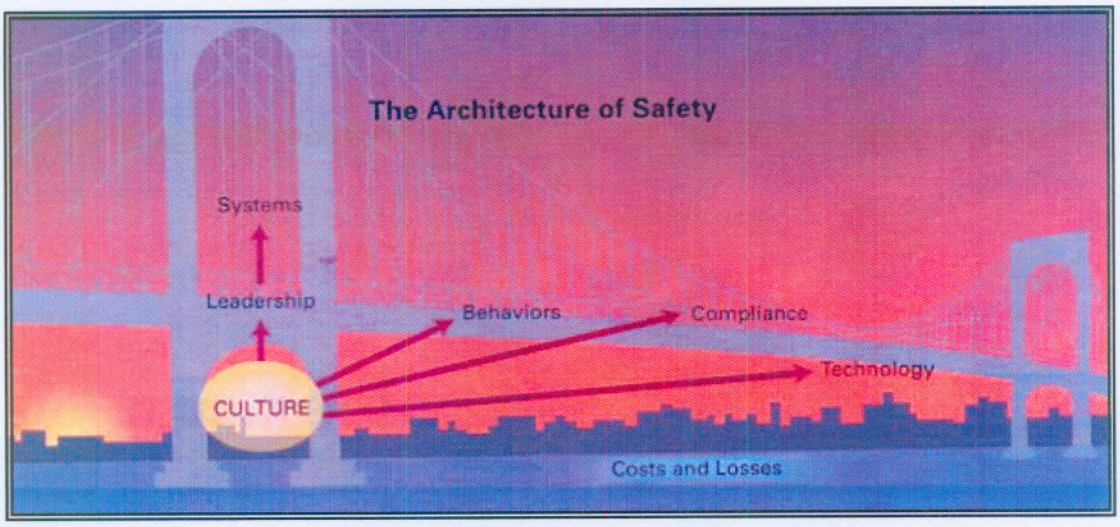


The Performance Map suggests that working on behaviours is too far downstream. We should be improving attitude by working on beliefs and values that lead to an organisation culture that predicts the attitudes that will exist within an organisation. The desired behaviours will then occur naturally. Attempting to change attitudes by the manipulation of behaviours is a risky business and often fails. Experiences with children probably provide the best example here.

Thus, working on beliefs and values can lead to an organisation culture that supports health and safety.

2. **The Bridge Metaphor** as defined by Hansen (2000), Figure 2.9 states that if you fall off a bridge for any reason, you are in the water and experiencing undesired losses with the associated costs.

FIGURE 2.9: THE BRIDGE METAPHOR – THE ARCHITECTURE OF SAFETY
Adapted from: Getting the safety culture right (Eckenfelder, 2003:34).



The bridge must be strong in all areas (leadership, systems, behaviours, compliance and technology). Industry has long attended to all the areas and neglected the main area of **culture**. Culture is argued as the most important area. The best way to make the other areas strongest is to deal with culture directly and so change it consciously and strategically. Thus, the bridge metaphor shows that while all safety areas are important, culture is the foundation and should be dealt with directly.

3. **The Safety Culture Barometer**, Table 2.4 is according to Eckenfelder (2003:34) a measurement "tool" that one can describe as a maturity grid of the health and safety culture.

TABLE 2.4: HEALTH AND SAFETY CULTURE BAROMETER

Safety Value	0 – Darkness Ignorance	1 – Dawn Entry level	2 – Mid Morning Novice	3 – Late Morning Mediocrity	4 – Noon Excellence	5 – Full Light Perfection
1 Do it for the right reasons	Safety driven by regulation, management directions and cost of accidents.	Concern for people occasionally mentioned but not backed up with actions. Employees don't believe it.	Flashes of real concern for people occur, but cynicism is ever-present.	Concern for people is balanced with compliance and injury costs but is seen as separate subject.	Concern for people is major safety driver but not in real harmony with goals.	Sincere concern for employees drives safety and is in perfect harmony with other activities.
2 See it as part of the whole	Safety is handled independently of the rest of the management process.	Safety is occasionally considered at staff meetings and during appraisals.	Efforts have been made to integrate safety, but they have been token and often failed.	Safety has parity with other staff functions, and management has a vision of how it should be integrated.	A plan to totally integrate safety exists. Independent safety discussions are becoming less frequent.	Loss prevention is totally integrated and accepted as essentials for business success.
3 Recognise there is no end.	Safety is managed by reaction and quick fixes.	Root cause determination and prevention efforts occur but are the exception.	Awareness that loss prevention is hard and ongoing is occasionally seen.	Management is initiating efforts that are self-perpetuating. Evidence of a long-term commitment to safety appears.	Critical behaviours and conditions are being defined and measured. A long-term commitment is evident.	Everyone recognizes that safety excellence is never-ending, like the Shewhart Cycle.

Adapted from: Eckenfelder (2003:36).

It takes the beliefs and values that are designed to encourage the development of the attributes of health and safety excellence and establishes organisation levels of maturity by collecting data from all employees or a selected cross-section of employees. The data is collected anonymously and leads to the creation of an organisation Health and Safety Culture Profile that can be displayed by shifts, departments, or levels of the organisation, or all the above and more. This illustrates where health and safety culture is weak and where it is strong. Then steps to enrich the safety culture can be taken consciously and strategically. If we need to strengthen ourselves physically or

intellectually, we do "exercises." We need to do the same thing to enrich culture or to strengthen ourselves or our organisation socially. There is no other way to do this. And, as Peter Drucker, the management guru, has said so many times: "If you can't measure, you can't manage." The Safety Culture Barometer provides the means and the methods to monitor progress.

4. Lastly, Eckenfelder (2003:34) lists the fourth cornerstone of the process as **exercises**. There are generic exercises that are suggested to enrich each of the suggested values. All this can be used in its generic form first, and then after some experience with the process, customization can be attempted.

2.5.5 Continuous Improvement Model

The Continuous Improvement Programme Action Group developed a model for continuous improvement in occupational health and safety culture, with the objective to describe where employers might stand on a 'barometer' for continuous improvement in occupational health and safety culture ($Anon_b$., 2003). In essence, the characteristics of the individual or group are considered and they are allocated to a broad 'market segment' which then informs the health and safety practitioner how they should be approached. In this case the organisations or groups of employers are not segmented by income, post grade, educational background or industry; instead they are segmented on the basis of the development of their occupational health and safety culture. Organisations can be examined to see:

- If they are **not interested** at all in occupational health and safety.
- If they simply **comply** with the health and safety requirements.
- If they are enthusiastic occupational health and safety **advocates**.

Identifying where employees are in terms of their cultural development allows the development of an appropriate strategy for improvement. This approach

can identify succinctly what is needed to move along a continuum from 'not interested' to 'excellent' (Anon$_b$., 2003).

The barometer model for continuous improvement in occupational health and safety is listed for both employers and employees, as shown in Tables 2.5 and 2.6. Three main groups are described; those not interested, the complier, the excellent. These three groups are set in a matrix against a description of:

- What drives the organisation's companies/sub-divisions to achieve a certain level of performance.
- What distinguishes higher achieving companies/sub-divisions from lower achieving ones.
- Likely perceived issues for the company.
- Those things needed to progress to the next level.

TABLE 2.5: CONTINUOUS IMPROVEMENT CYCLE MODEL SEGMENTATION OF EMPLOYERS

Description	The Uninterested or Those yet to be fully engaged	The Complier	The Very Good
Basic Drivers	▪ Enforcement ▪ Regulation ▪ Insurance ▪ Cost	▪ Enforcement ▪ Regulation ▪ Insurance ▪ Cost ▪ Humanitarian concerns ▪ Benchmarking ▪ Embarrassment if "caught"	▪ Cost – Investing in health to save in the future ▪ Insurance ▪ Humanitarian concerns – translated into action ▪ Understanding ▪ Desire to be excellent ▪ Reputation / Brand image ▪ Corporate social responsibility
Differences from Previous / Lower Level		▪ Awareness – higher level ▪ Resources applied to management of H&S ▪ Expertise – some limited access to advice	▪ Awareness – understanding of business costs to poor performance ▪ Awareness – OH staff better able to articulate arguments and have the ear of senior managers ▪ In some cases - size – often large companies have enough employees to see various OH issues manifest themselves and as such they are seen as real business issues. ▪ Expertise – high level often available in-house ▪ Visible senior management commitment

Description	The Uninterested or Those yet to be fully engaged	The Complier	The Very Good
			▪ Measurement
Likely perceived issues	▪ Lack of awareness of OH issues ▪ Lack of awareness of the scale and severity of the issue ▪ No perceived access to expertise ▪ Cost – concern about; bleak cheque for treatment ▪ No internal resources ▪ Belief that they won't get "caught" ▪ In some cases profit before people ▪ Not looking at long-term / sustainable business	▪ Often OH is not integrated into the day to day management of business ▪ Line management do not perceive the need for the management of 'softer' issues ▪ Often a restricted view of the role of OH ▪ Complier who uses the letter of the law may not be complying in a morally good way	▪ Where does OH stop? ▪ What are the issues that we can effectively manage in the future? ▪ Can possibly delay decisions because "everyone" consulted ▪ Difficulty keeping tabs on all activities that are being done
Needs to progress to next level	▪ Understanding the issue ▪ Understanding of a proportionate response ▪ Easy low cost access to OH support ▪ Push from insurers ▪ Simple activities which can be undertaken by staff with minimal training ▪ Individual to champion the cause ▪ Mentoring from other businesses in 'Very Good' Group	▪ Stronger emphasis on OH in management training ▪ Best proactive examples from exemplars ▪ Supply chain / peer pressure ▪ Development of OH champion ▪ Mentoring from other businesses in ' Very Good' Group	▪ Competitions for ideas in key areas (open area up to those beyond traditional stakeholders e.g. Back in Work programme) ▪ Exchange forums ▪ Involvement in education of next generation whether large company or SE ▪ Additional employee ownership

Adapted from: Anon$_b$ (2003).

TABLE 2.6: CONTINUOUS IMPROVEMENT CYCLE MODEL SEGMENTATION OF EMPLOYEES

Description	The Uninterested or Those yet to be fully engaged	The Complier	The Advocate
Basic Drivers	▪ Rules ▪ Enforcement / Discipline ▪ Financial Motivation ▪ Personal Gain (even when others may lose) ▪ Managerial Drive ▪ Reinforcement of previous poor behaviour ▪ Peer Approval / Pressure Comfort ▪ Custom and practice behaviours	▪ Personal commitment ▪ Personal engagement ▪ Personal equity ▪ Safe Systems of Work ▪ Procedures ▪ Reinforcement of correct behaviour ▪ Knowledge and understanding of risk ▪ Managerial drive ▪ Availability of equipment ▪ Comfort and looks of equipment ▪ Reward structures	▪ Personal belief ▪ Engagement ▪ Feedback ▪ Personal Goals and objectives ▪ Expectations ▪ Knowledge ▪ Life-long learning behaviours
Differences		▪ Motivation	▪ Visible senior management

Description	The Uninterested or Those yet to be fully engaged	The Complier	The Advocate
from Previous / Lower Level		▪ Knowledge ▪ Activity ▪ Acceptance that they may be involved in an accident / case of ill health (personal experience, personal or corporate memory) ▪ Level of engagement ▪ Understanding of what needs doing ▪ Interested in today and tomorrow ▪ Cares about self and co-workers	commitment ▪ Support ▪ Knowledge ▪ Opportunity ▪ Reinforcement ▪ Goals ▪ Peer support ▪ Also interested in the day after ▪ Cares about business success ▪ Accepts change as inevitable ▪ Can visualise long-term gains ▪ Has a participative culture
Likely perceived issues	▪ Individuals do not feel they will be affected ▪ Lack of Knowledge ▪ Lack of understanding of probability ▪ Compliance make the job harder ▪ Inconsistent messages from management ▪ Reward structures (piece work) ▪ Lack of correct equipment ▪ Task design ▪ Lack of corporate and/or individual memory ▪ Do not have a defined role to play ▪ Industrial relations ▪ Belief that safe working is inefficient ▪ Lack of time/ resource ▪ Live within a blame culture ▪ Lacks initiative and/or flexibility ▪ "Hates" change ▪ Only interested in today ▪ Only cares about themselves ▪ Custom and practice behaviours	▪ Visibility of what is possible (you only know what you know) ▪ Focus on the short term here and now not gradually developing conditions ▪ Ability to accurately see problem (problem definition and problem solving skills) ▪ IT skills ▪ Possible peer pressure ▪ Lack of corporate and individual memory ▪ Understanding of health risks i.e. level of knowledge of Asbestos vs. knowledge occupational asthma ▪ Access to network ▪ Interpersonal / team skills ▪ Avoids change ▪ Belongs to a passive / non-inclusive culture	▪ Not having a full appreciation of what is possible ▪ Need for consistency of purpose ▪ Promotion (strong advocates with the right skills often get promoted and moved out of Health and Safety) ▪ Design ▪ Keeping knowledge up to date ▪ Expectations ▪ Sudden changes (site of business) ▪ Belongs to a participative culture ▪ Work-life balance needs watching
Needs to progress to next level	▪ Training / Education ▪ Consistent messages from management ▪ Frequent reinforcement of safety and health behaviour ▪ Evidence that concerns and suggestions are taken seriously ▪ Good/task equipment design	▪ Tools – Problem solving – Benchmarking – ABC analyses – Interpersonal / team skills ▪ Help to see the long-term ▪ Positive engagement ▪ Reinforcement ▪ Consistency ▪ Help in understanding	▪ Case studies ▪ Competitions ▪ Benchmarking ▪ Corporate structure ▪ Engagement (providing regular information for management) ▪ IT support ▪ Problem solving tools ▪ Societal approval ▪ Publicity material

Description	The Uninterested or Those yet to be fully engaged	The Compiler	The Advocate
	▪ Methods of improving individual and corporate memory (i.e. storytelling) ▪ Engagement – clearly defined focused health and safety activities ▪ Understanding of motivation ▪ Team activities	risks ▪ Organisation structures to provide guidance and support ▪ Culture ▪ Reasonable, rational and logical arguments	

Adapted from: $Anon_b$ (2003).

1. **Drivers.** (To understand what drives each of these groups.)
   The same thing does not motivate all organisations. In particular motivations for those who have yet to start on the occupational health and safety journey are very different to those who are already very good. For example, fear of legislation often motivates those who are just considering what occupational health and safety actions they need to take, whilst for the very good organisation it might slightly influence the shape of some of the standards applied that are already in excess of the legal standard. Generally speaking, for the very good, legislation is not a prime motivator ($Anon_b$., 2003).

2. **Differences from Previous Level.** (What makes each level different from the previous level? What has changed to inspire progress to the next level?)
   This is important as it helps us to recognise what success looks like so that we can evaluate if things have indeed changed ($Anon_b$., 2003).

3. **Likely perceived issues.** (The hurdles which could prevent progress.)
   If correctly identified such hurdles can be dealt with; if not, they can stop an organisation progressing. Where the hurdle is due to ignorance it can generally be overcome either through awareness or the provision of practical assistance. Yet again these will be different depending on how developed the organisation is.

4. **Needs to progress to next level.**

   These are the actions that are required in order to address the issues previously identified. If these are provided then they should assist the organisation in developing in Occupational Health and Safety terms ($Anon_b$., 2003).

2.5.6 Six key principles for sustainable continuous improvement

According to Vassi (1998:579), based on the work of Bessant, there are six key principles for successful long-term implementation of continuous improvement programmes. These include:

1. ***Clear strategic framework*** – which must be clearly incorporated into the organisation's strategic agenda?
2. ***Underlying supportive culture*** – with widespread recognition of the importance and value of continuous improvement and an acceptance that everyone in the organisation has something to contribute to the process.
3. ***Enabling infrastructure*** – with the adoption of organisational structures which promote efficient two-way communication and decentralised decision-making.
4. ***Strategic management*** – including regular targets and milestones (short and long-term) and well-communicated measurement and display routines.
5. ***Process management*** – with the adoption of learning or problem solving processes.
6. ***Range of supporting techniques*** – including problem-solving tools with training in their application.

2.5.7 Sustaining the Strategy

Helmer (2002: 14) writes: "People's behaviours are a direct reflection of their backgrounds and experiences, and the appropriate modification of those behaviours to enhance the safety and welfare of others is the task each of us faces. We are continually challenged to strengthen and develop a health and safety culture that sustains the caring leader's health and safety strategy."

People, by their very nature, want a safe and healthful setting. Often, the problem is that we don't know how or haven't got the tools to ensure we maintain the right environment. Get everyone involved, listening to the health and safety issues and taking action, ensuring that managers are committed to supporting health and safety at all levels, holding all personnel accountable for their actions. Making health and safety part of every process will help develop a culture that sustains the strategy (Helmer, 2002: 14).

According to Millar (1993:100) "if we, as a nation, can spread the principle of respect for people and their health and safety and assist businesses who want to practice this principle, neither prevention nor quality can fail. Enlightened management and empowered workers are our best hope for achieving safe and healthful working conditions".

2.6 CONCLUSION OF LITERATURE STUDY

Chapter 2 represents the literature study that was done for the development of a continuous improvement strategy for an occupational health and safety culture.

The concepts of culture and organisational culture were studied in more detail in terms of the elements it consists of. Mention is made of a competing values

model which explains the differences in the values, underlying various organisational effectiveness models. Furthermore, organisational culture was described in terms of the factors which should be considered if one wants to change, manage and measure the culture. The concept of an occupational health and safety culture was introduced, defined and discussed in terms of five global components or indicators as well as the cornerstones of such a culture. Lastly, a health and safety culture barometer is suggested as a measurement tool to determine a company's health and safety culture profile. The concept of continuous improvement was introduced and six key principles were discussed to ensure successful long-term implementation of a sustainable improvement strategy.

The knowledge gained from the literature study will be applied during the empirical study as discussed in Chapter 3, and for the conclusions and recommendations in Chapter 4.

CHAPTER 3
EMPIRICAL STUDY

3 CHAPTER 3: EMPIRICAL STUDY

Company X's health and safety culture has developed and matured significantly over the last decade and this has made some contribution to the elimination of significant incidents, injuries and illnesses. The further refinement of the health and safety culture to eliminate all incidents, injuries and illnesses will require that more emphasis be placed specifically on certain of the health and safety management elements (management of change, contractor management and process hazard analysis) as well as general hazard identification and treatment. From this analysis the need for the development of a continuous improvement strategy to enable this refinement was born.

The goal of this empirical study is thus to investigate the following issues:

- Determining which segment the company or group of employees fall into.
- Identifying those attributes that is preventing further progress.
- Considering how these attributes may be overcome.
- Considering which of the identified attributes need to be applied.
- Considering how the motivations for the specified group can be used to get further engagement in relation to the identified needs.

3.1 THE RESEARCH PROCESS

Page and Meyer (2000:35), Cooper and Schindler (2001:61) and Welman and Kruger (1999: xiii) mention three different illustrations of the research process. However, there is a great element of commonality between these three processes. For the purpose of this dissertation, the research process of Cooper and Schindler will be adopted, as well as reference to the other two research processes, supplemented with the work of other authors on the subject of research methodology (Viljoen, 2003:63).

The **research process** model of Cooper and Schindler (2001:61) consists of ***seven phases***, namely:

1 Discovering the management dilemma, defining the management question and research question(s) and refining the question(s).
2 Writing the research proposal.
3 Research design, which consists of a design strategy, data collection design, sampling design, testing of questions and instrument pilot and finally instrument revision.
4 Data collection and preparation.
5 Data analysis and interpretation.
6 Research reporting.
7 The management decision.

The seven phases can be grouped in one of ***three stages*** (Cooper and Schindler, 2001:62):

Stage 1 - **Research planning and design**, consisting of:
- Discovering the management dilemma.
- Defining the management question.
- Define the research question(s).
- Refining the research question(s).
- Designing the research strategy.
- Designing data collection.
- Sampling design.

Stage 2 - **Data gathering**, consisting of:
- Questions and instrument pilot testing.
- Data collection and preparation.

Stage 3 - **Analysis, interpretation and reporting**, which includes:
- The research proposal.

- Revision of the design instrument.
- Analysis of data and interpretation.
- Reporting on the research.
- The management decision.

3.2 RESEARCH PLANNING AND DESIGN

3.2.1 Research question

The empirical research on a continuous improvement strategy for an occupational health and safety culture starts from where the topic has been discovered and terminates when management makes a decision, whether that is to implement the recommendations or even to ignore the research findings. For the purpose of this study, formulating recommendations will terminate the research process (Viljoen, 2003:62).

The literature study in Chapter 2 highlighted the importance of a health and safety culture in the organisation's culture. The elements of a health and safety culture and the importance thereof in the organisational culture as well as the continual improvement of culture were described.

A health and safety culture would seem to be a complex construct that includes values and attitudes (particularly commitment and job satisfaction), perceptions and communications, most of which are potentially changeable and relate to actual accident behaviour (Harvey *et al.*, 2002:22).

To determine to what extent Company X's health and safety culture is matured and to identify where employees are in terms of their cultural development, an empirical study was undertaken.

These aspects were used as the basis for formulating the input variables of the questionnaire used during the study.

Data collected through the questionnaires can be classified as either variables or attributes. Variables are those characteristics which are measurable, normally expressed in numerical terms such as the amount spent on medical surveillance per annum or actual use of a specific service, while attributes are characterised by either a conformance or non-conformance to a statement / specification (Wisniewski, 2002:15). It is important that the input attributes identified relate to the objectives of the study which has been proposed (McGarrie, 2003:58).

3.2.2 Research design

Research design consists of the strategy for a study and the plan by which the strategy is to be carried out. It specifies the methods and procedures for the collection, measurement and analysis of data.

Both Cooper and Schindler (2001:134) and Page and Meyer (2000:41) state that research design is the blueprint for fulfilling an objective and answering questions, and it is suggested that the process consists of the following stages:

- **Translating the research question into research variables**.
  This can be achieved through secondary data published by authors outside the organisation (Cooper & Schindler, 2001:141). In this study, a literature research was done using articles, books and periodicals on the research subject. Secondary or existing data are an invaluable addition to any research endeavour (Page & Meyer, 2000:96).

- **Choosing an appropriate sampling and data collection method.**

The research design used in this study was that of a survey. Page and Meyer (2000:114) defines a survey as enabling the researcher to study the population sample in order to infer characteristics of a population (generalise findings).

- **Choosing an appropriate analysis method.**
- **Deciding on a time frame and budget.**

3.2.3 Statistical techniques

In order to conduct a statistical analysis of the results of the questionnaire one must first develop an understanding of the theory of statistical techniques. This section details those techniques used for this research.

3.2.3.1 Statistical background

Statistics has generally **three accepted meanings**, namely:

- It is a collection of quantitative data pertaining to any subject or group especially when the data are systematically gathered and collated.
- It is the science that deals with the collection, tabulation, analysis, interpretation and presentation of quantitative data.
- It is an important tool in transforming masses of raw data into meaningful, useful and usable information for decision-making.

(Wisniewski, 2002:91 and Wegner, 2003:2)

Wisniewski (2002:91) and Wegner (2003:5) state that there are **two major components** of Statistics:

- ***Descriptive statistics***, which condenses large volumes of data into a few summary measures by describing and analysing a subject or group, to determine some measure of an average and some measure of variability around the average.

- ***Inferential or inductive statistics***, which endeavours to determine from a limited amount of data (sample) an important conclusion about a much larger amount of data (universe or population).

3.2.3.2 Statistical definitions

The statistical terminology mentioned in the study, can be defined as follows:

- **Population**: Wisniewski (2002:100) defines a population as that part that relates to the entire data set that is of interest.
- **Sample:** Sampling can be defined as a selection of only a part of the research population (Page and Meyer, 2000:43 and Wisniewski, 2002:100).
- **Sample mean:** Wisniewski (2002:92) and Wegner (2003:55) tell us that there are **two measures of average**:
- The **arithmetic mean**, which is a sum of the total values divided by the number of values measured.
- The **median**, which is the middle value from the total values recorded.
- **Standard deviation:** The standard deviation of a sample is a measure that reflects how the numerical data are dispersed (Berenson & Levine, 1996:121). For the purpose of this study it will be used to indicate the level of agreement between the responses on any particular question. A standard deviation of 1 or less indicates a high level of agreement, and a value higher than 1 indicates disagreement of responses.

3.2.3.3 Statistical application

The measure of variability around the average value used in this study is that of ***standard deviation*** (Wisniewski, 2002:96).

Due to the nature and limited period available for this research, ***inferential or inductive statistics*** will be applied to develop a continuous improvement strategy for an occupational health and safety culture.

3.2.4 Sampling design

The researcher should decide between sampling, selecting some of the elements in a population and a census, which include all the elements in a population (Parten, 1950:109).

Sampling design (stage 2 according to Page and Meyer (2000:41)) entails the identification of a target population and selecting a sample. The best sample designs ensure that the sampled data represent the research population efficiently and reliably (Viljoen, 2003:68).

The size of the population usually makes it impractical and uneconomical to involve all members of the population in a research project (Welman & Kruger, 1999:47) and according to Page and Meyer (2000:106), it is often funds rather than research requirements that determine what the sample size will be. Consequently, a sample will be taken of a population and this will be assumed to be representative of the population.

Quota sampling was thus applied for this study, meaning that respondents are selected by the interviewer rather than by chance (Page & Meyer, 2000:100). Interviewer bias is possible in quota samples. It is possible that sections of the population will be either deliberately or subconsciously omitted from the sample. Because of this possible bias in quota samples, it is dangerous to generalise the findings from a quota sample to the entire population (Page & Meyer, 2000:101).

According to Page and Meyer (2000:103), a typical question therefore is not to ask, 'How large the sample should be', but instead 'What can a certain

sample size (n) do for us?' A quantity called a **design effect (d)** is used to measure the quality of a sample design. The design effect is used to calculate an **effective sample size (e)** from the actual sample size (n) using the formula ***e=n/d.*** The effective sample size provides a more meaningful indication of the number of independent (useful) responses than the actual sample size. A design effect (d) of 2.00 is listed for a quota sample design. A design effect of more than 1.0 means that the sample is not as efficient as a random sample should be.

Although this study have a potential population totalling 5 200 employees, it was decided to sample as many as possible, but not aiming to include all employees.

3.2.5 Data collection design

The existing scenario would be determined for the purpose of this study, with the use of a questionnaire, measuring the psychological, behavioural and situational aspects of an occupational health and safety culture in Company X.

The questionnaires will be distributed through e-mail and personal contact. The return of the questionnaires will be followed up using e-mail, telephone calls, and personal contact to ensure a high return rate. All questionnaires will be treated confidentially to ensure that facts are not distorted.

The results will be statistically analysed using an appropriate statistical methodology. The analysed results will be used to draw conclusions and recommendations will be made regarding the development of a continuous improvement strategy for an occupational health and safety culture.

3.3 DATA GATHERING

3.3.1 Target population

The empirical study will be aimed at a sample consisting of employees (occupational health and safety practitioners, company management members, maintenance and production operators) situated at the two identified sites of Company X. Plants at the two sites perform related work in that they are both involved in chemical operations. These plants operate either independently of each other or are depending on feedstock from in-line plants. Certain of the plants on the sites have similar age and length of service distributions, others are quite new.

100 respondents, both pre- and randomly selected were identified for the sample. An effective sample size (*e*) of 50 is deemed satisfactorily for the purpose of this mini-dissertation.

3.3.2 Preparation and structuring of the questionnaire

For study objectives to be met, the questions used in the questionnaires should be related to the issues under investigation. It was therefore necessary to conduct a literature study (Chapter 2) to become familiar with the issues relating to the concept and existence of health and safety culture models and continuous improvement strategies.

Harvey *et al.* (2002:20) states that there are several theories linking attitudes and behaviour. They further suggest that 'constructive' attitudes are probably the most important single index of the effectiveness of a health and safety culture as they result from all other contributory features. Lee (1993) identifies groups of attitudes that are relevant to health and safety. The questionnaire was structured, with the above in mind, according to the seven

critical success factors/attitudes as identified in literature. These factors include:

- Factor 1 - Management style and communication.
- Factor 2 - Commitment, accountability and involvement.
- Factor 3 - Risk awareness.
- Factor 4 - Risk-taking of self and responses to risk-related behaviour
- of others.
- Factor 5 - Job satisfaction.
- Factor 6 – Responsibility.
- Factor 7 - Complacency.

When applying the attitude theory it is important to note that attitudes can change as interventions are implemented.

The survey questionnaire (Appendix 1) was constructed by formulating a total of 71 Likert-style questions divided into the seven critical success factors as identified during the literature study.

A five-point scale was used, ranging from *I strongly disagree, I disagree, I neither disagree nor agree, I agree and I strongly agree.* The main reason for the five-point scale is that most of the people working at Company X are familiar with it as it is used for the annual merit appraisals. A five-point scale also assists in forcing the individual to make a decision.

In addition, the **importance** of each question, whether perceived as low, medium or high, was requested in order to test if there is a relationship between the evaluation and importance feedback.

Furthermore respondents were requested to indicate their generic job categories as well as in which department they work.

3.3.3 Instrument pilot testing

To aid the process of data collection and to improve understanding of the questions, the questionnaire was subjected to a pilot test. Cooper and Schindler (2001:81) state that a pilot test is conducted to detect weaknesses in design and instrumentation. A pilot group of six people was identified to comment on the questionnaire's content and language. After careful consideration of all the feedback these suggestions were incorporated in the final questionnaire as it appears in Appendix 1. Typical suggestions included:

- All questions should be drafted as a statement.
- Only one statement per question or sub-question.
- Some of the terminology was changed.

3.4 RESPONSE TO QUESTIONNAIRE

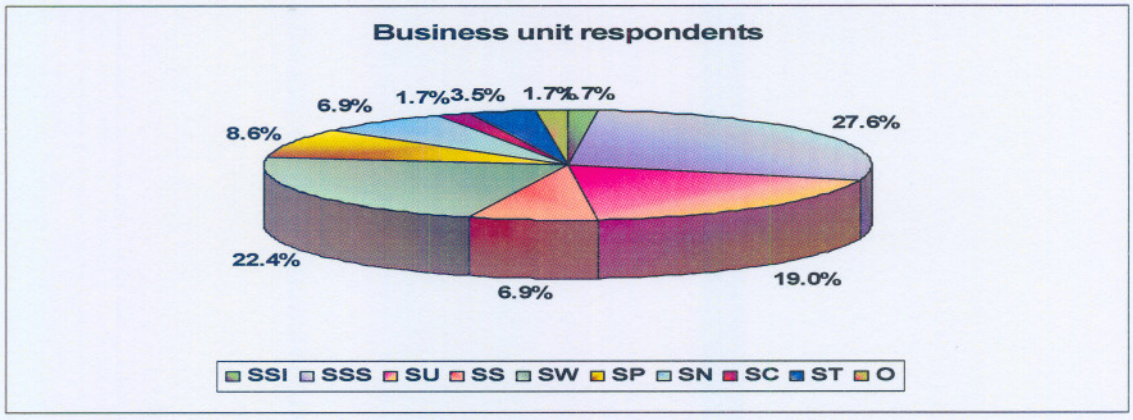
The survey questionnaire was distributed to a selected group of people including managers, production, maintenance, administrative and other job categories at 10 business units. Of the 100 questionnaires sent out, 58 responses (58 %) were received by the cut-off date. Despite several telephone calls, e-mails and personal reminders, the outstanding questionnaires were not completed and returned by the cut-off date.

3.4.1 Demographic detail

3.4.1.1 *Geographic dispersion of respondents*

From Table 3.1 and Graph 3.1 it is evident that the bulk of the responses were received from the business units including SSS (27.59 %), SW (22.41 %) and SU (18.97 %). It is suspected that the higher response rates from these business units were driven by personal contact (being in the same

department) and enthusiasm concerning the topic expressed by SW colleagues.



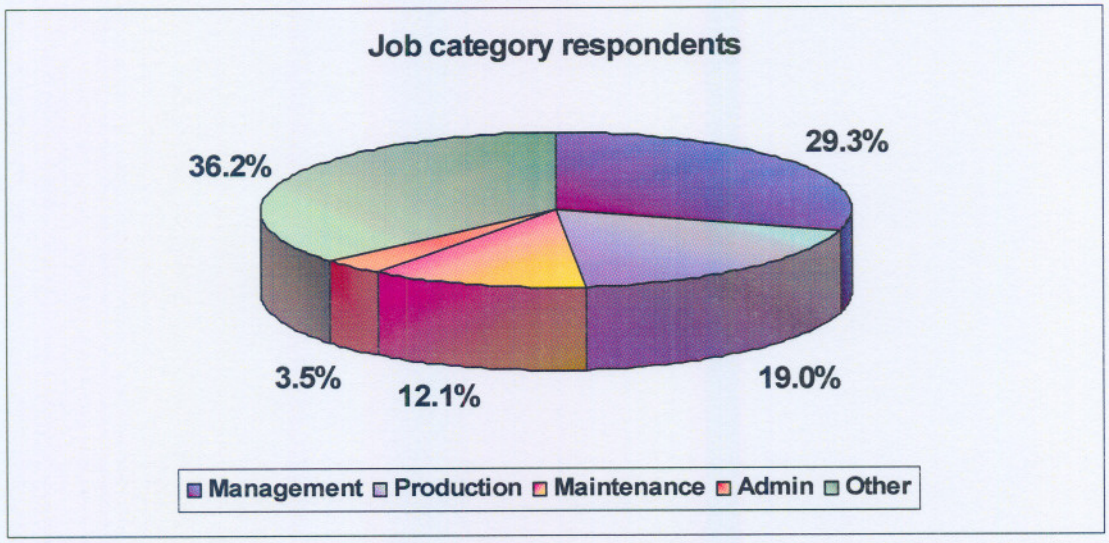
GRAPH 3.1: GRAPHICAL PRESENTATION OF RESPONDENTS' ORIGIN

TABLE 3.1: PERCENTAGE DISTRIBUTION OF RESPONDENTS

Company subdivision	Percentage of respondents					Total % of respondents (58)
	Management	Production	Maintenance	Administration	Other	
SSI	1.72	-	-	-	-	1.72
SSS	13.79	-	1.72	3.45	8.62	27.59
SU	5.17	5.17	1.72	-	6.90	18.97
SS	-	-	1.72	-	5.17	6.90
SW	1.72	8.62	5.17	-	6.90	22.41
SP	3.45	-	-	-	5.17	8.62
SN	3.45	1.72	1.72	-	-	6.90
SC	-	1.72	-	-	-	1.72
ST	-	-	-	-	3.45	3.45
O	-	1.72	-	-	-	1.72
Total	29.30	18.95	12.05	3.45	36.21	100.00

3.4.1.2 *Job category respondents*

A breakdown of respondents by job category is represented in Table 3.1 and Graph 3.2. Job categories "other" and "management" accounts for two thirds of the respondents with maintenance and production for the rest.



GRAPH 3.2: GRAPHICAL PRESENTATION OF JOB CATEGORY RESPONDENTS

3.5 DATA ANALYSIS

3.5.1 Statistical processing of data

The data received from the completed questionnaires were processed using Excel spreadsheets. The standard Excel functions have been used for the calculations of the mean and standard deviation of the population.

3.5.2 Analysis of data

All 71 items were first considered separately in a descriptive way. Means for the evaluation part ranged from $\bar{\chi}$ = 1.29 (item 2.04, concerned with the role of health and safety) to $\bar{\chi}$ = 4.66 (item 6.11, concerned with the responsibility of health and safety). Standard deviations ranged from 0.37 (telling people if they act in a wrong and unsafe manner) to 1.29 (willing to take risks if the consequence is known).

Means for the importance of factors ranged from $\bar{\chi}$ = 1.60 (factor 4.05, concerned the nuisance factor of slow workers) to 2.74 (factor 3.01,

concerned with the priority that health and safety matters should take). Standard deviations ranged from 0.45 (telling people if they act in a wrong and unsafe manner) to 0.81 (not wanting more responsibility with health and safety).

The results were grouped for each critical success factor in Tables 3.2 to 3.8. In all cases respondents were requested to rate the current occupational health and safety culture in accordance with a five point Likert Scale. The results were furthermore interpreted in order to make the necessary conclusions and recommendations. These recommendations fulfil the secondary goal of this research.

3.6 INTERPRETATION OF DATA

For the evaluation of attributes a sample mean of 4 or higher is viewed as an indication that the attribute is fully addressed. A sample mean between 3.5 and 4 is viewed as an indication that the attribute is moderately addressed. A sample mean of lower than 3.5 indicates that the attribute has not been sufficiently addressed. It is therefore an indication of a gap between the ideal situation described in Chapter 2, and the current health and safety culture experienced at the company.

For the importance rating of attributes a sample mean of 2 or higher is viewed as an indication that the attribute is very important. A sample mean between 1.5 and 2 is viewed as an indication that the attribute has a medium importance. A sample mean of lower than 1.5 indicates that the attribute has a low importance.

3.6.1 Factor 1 – Management style and communication

Management style and communication was highlighted in Chapter 2 as one of the most important factors for a satisfactory health and safety culture. It is therefore essential that there is coherence between implemented company strategies and consistent messages on overall health and safety issues. Table 3.2 summarises the responses to this factor. Detail analysis of these attributes are reflected in Appendix A3 (2), Graphs A3.1 - A3.2.

TABLE 3.2: FACTOR 1 - MANAGEMENT STYLE AND COMMUNICATION

	Attribute	Evaluation		Importance	
		Mean	SD	Mean	SD
1.	This company's health and safety program is driven by regulations, management direction and cost of accidents.	3.81	1.10	2.60	0.65
2.	Concern for employees is occasionally mentioned but it is not backed up with actions.	2.59	1.28	2.48	0.71
3.	Flashes or real concern for employees occur, but cynicism is ever present.	3.22	1.08	2.03	0.65
4.	Sufficient time and / or energy are committed to health and safety.	3.86	1.00	2.67	0.60
5.	Concern for employees is balanced with compliance and injury costs but it is seen as separate subjects.	3.10	1.04	2.22	0.68
6.	Within reason, people in this department can say what they want without fear of punishment.	3.36	1.19	2.10	0.72
7.	Managers listen to safety ideas and provide funds to implement it.	3.78	0.88	2.28	0.64
8.	Concern for employees is a major health and safety driver but it is not in real harmony with the goals.	2.88	1.04	2.26	0.69
9.	We are always under pressure to get things done.	3.97	0.92	2.28	0.64
10.	I am encouraged to make health and safety improvement suggestions.	3.93	0.88	2.21	0.64
11.	Managers here do a good job of communicating health and safety issues with employees.	3.72	0.87	2.41	0.68

Health and safety programs (Attribute 1)

Although 72 % of the respondents agreed with this statement, with 9 % undecided and 19 % in disagreement, a mean of 3.81 (standard deviation =

1.01, indicating disagreement of responses) was calculated. The admin and production job categories felt that this attribute is fully addressed, whereas management and other job categories felt it is moderately addressed and maintenance that it has not been sufficiently addressed; refer to Table A3.1, Appendix 3. Overall the respondents felt that this attribute is moderately addressed and there was a high level of agreement that it is of high importance; refer to Table 3.2.

Concern for employees (Attributes 2, 3, 5 & 8)

40 % of the respondents agreed with these statements, 20 % was undecided and 40 % were in disagreement. A mean of 2.95 (standard deviation = 1.11, indicating disagreement of responses) was calculated. On average all the job categories felt that these attributes have not been sufficiently addressed; refer to Table A3.1, Appendix 3. There are thus two schools of thought that the company does and doesn't express sufficient concern for its employees. A high level of agreement was expressed in regard to the high importance these statements should receive; refer to Table 3.2.

Time factor (Attributes 4 & 9)

78 % of the respondents agreed that sufficient time and/or energy is committed to health and safety, with 5 % undecided and 17 % in disagreement. A mean of 3.86 (standard deviation = 1.00, indicating disagreement of responses) was calculated. The maintenance, admin and production job categories felt that this attribute is fully addressed, whereas management felt it is moderately addressed and other that it has not been sufficiently addressed; refer to Table A3.1, Appendix 3. Overall the respondents felt that this attribute is moderately addressed and there was a high level of agreement that it is of high importance; refer to Table 3.2.

78 % of the respondents agreed that they are always under pressure to get things done, with 12 % undecided and 10 % in disagreement. A mean of 3.97 (standard deviation = 0.92, indicating high level of agreement of responses)

was calculated. The management, other and admin job categories felt that this attribute is true, whereas maintenance felt it is moderately addressed and production that it is not a problem; refer to Table A3.1, Appendix 3. Overall the respondents felt that they work more than average under pressure. There was a high level of agreement that it is of high importance; refer to Table 3.2.

Communication (Attributes 6, 7, 10 & 11)

Fear of punishment

59 % of the respondents agreed that they can express themselves without fear of punishment, with 9 % undecided and 32 % in disagreement. A mean of 3.36 (standard deviation = 1.19, indicating disagreement of responses) was calculated. Management and admin job categories felt that this attribute is moderately addressed and maintenance, other and admin felt that it has not been sufficiently addressed; refer to Table A3.1, Appendix 3. Overall the respondents felt that this attribute has not been sufficiently addressed but there was a high level of agreement that it is of high importance; refer to Table 3.2.

Ideas generation and implementation

82 % of the respondents agreed that they are encouraged to make improvement suggestions and that funds are provided for implementation, with 8 % undecided and 10 % in disagreement. A mean of 3.86 (standard deviation = 0.88, indicating high level of agreement of responses) was calculated. The management and maintenance job categories felt that this attribute is fully addressed, whereas other, admin and production felt it is moderately addressed; refer to Table A3.1, Appendix 3. Overall the respondents felt that this attribute is moderately addressed and there is a high level of agreement that it is of high importance; refer to Table 3.2

Communicating health and safety issues

74 % of the respondents agreed that sufficient time and or energy is committed to health and safety, with 14 % undecided and 12 % in disagreement. A mean of 3.72 (standard deviation = 0.87, indicating agreement of responses) was calculated. The maintenance job category felt that this attribute is fully addressed, whereas other, admin and production felt it is moderately addressed and management themselves see it as not been sufficiently addressed; refer to Table A3.1, Appendix 3. Overall the respondents felt that this attribute is moderately addressed and there was a high level of agreement that it is of high importance; refer to Table 3.2.

3.6.2 Factor 2 – Commitment, accountability and involvement

One of the identified attitudes relevant to establishing a positive health and safety culture, includes how committed, accountable and involved both employees and management are concerning health and safety matters. Table 3.3 summarises the responses to this factor. Detail analysis of these attributes are reflected in Appendix A3 (2), Graphs A3.31 - A3.4.

TABLE 3.3: FACTOR 2 – COMMITMENT, ACCOUNTABILITY AND INVOLVEMENT

Attribute	Evaluation		Importance	
	Mean	SD	Mean	SD
1. We are all accountable for our own and the plant's health and safety.	4.28	0.89	2.71	0.56
2. Health and safety is handled independently from the rest of the management processes.	2.40	1.06	2.31	0.68
3. I should discuss health and safety matters with others.	4.47	0.54	2.50	0.66
4. Health and safety matters are not my role.	1.29	0.73	2.05	0.71
5. My health and safety ideas are ignored.	2.22	1.14	2.05	0.51
6. Health and safety has parity with other staff functions, and management has a vision of how it should be integrated.	3.62	0.97	2.24	0.60
7. The health and safety of workers is a high priority with management.	4.09	0.98	2.64	0.67
8. I do not want more responsibility with regard to health and safety.	2.17	0.98	2.10	0.81

Attribute	Evaluation		Importance	
	Mean	SD	Mean	SD
9. Employees and management work together to ensure the safest and most healthful working conditions.	3.55	1.01	2.48	0.75
10. I should tell a person if they act in a wrong or unsafe manner.	4.84	0.37	2.84	0.45
11. Conventional safety is not important to me.	1.71	0.73	2.00	0.65
12. The morale of employees is important.	4.40	0.59	2.41	0.62

Accountability of own and other's health and safety (Attribute 1 & 10)

95 % of the respondents agreed with this statement, with 2% undecided and 3 % in disagreement. A mean of 4.56 (standard deviation = 0.63, indicating agreement of responses) was calculated. The entire job category felt that these attributes are fully addressed; refer to Table A3.2, Appendix 3. Overall the respondents felt that the attributes are of high importance; refer to Table 3.3.

Integration of health and safety with management processes and staff functions (Attributes 2 & 6)

47 % of the respondents agreed with this statement, with 10% undecided and 43 % in disagreement. A mean of 3.01 (standard deviation = 1.02, indicating disagreement of responses) was calculated. All the job categories felt these attributes have not been sufficiently addressed; refer to Tables A3.2 and A3.6, Appendix 3. Overall the respondents felt that these attributes have not been sufficiently addressed but there was a high level of agreement that it is of high importance; refer to Table 3.3.

Own commitment to health and safety matters (Attributes 3 & 4)

All the job categories were in agreement with 98 % of the respondents agreeing that they should discuss health and safety matters with others, whereas only 3 % agreed that it is not their responsibility. A mean of 4.47 (standard deviation = 0.54, indicating agreement of responses) was

calculated. A high level of agreement that it is of high importance was indicated; refer to Table 3.3.

Involvement in health and safety matters (Attributes 5, 8, 11 & 9)

All the job categories were in agreement with 78 % of the respondents that their ideas are not ignored; that they do want more responsibility with regard to health and safety and that conventional health and safety is important to them. A high level of agreement that it is of high importance was indicated; refer to Table 3.3.

62 % of the respondents agreed that employees and management work together to ensure the safest and most healthful working conditions, with 21% undecided and 17 % in disagreement. The maintenance job category felt that this attribute is fully addressed, while management and admin felt it is moderately addressed and other and production that it has not been sufficiently addressed; refer to Table A3.2, Appendix 3. A mean of 3.55 (standard deviation = 1.01, indicating disagreement amongst responses) was calculated. Overall the respondents felt that this attribute is moderately addressed and there is a high level of agreement that it is of high importance; refer to Table 3.3.

Priority and morale towards health and safety (Attributes 7 & 12)

82 % of the respondents agreed that health and safety has a high priority with management, with 12% undecided and 6 % in disagreement. The maintenance, admin and production job category felt that this attribute is fully addressed, whereas management and other felt it is moderately addressed; refer to Table A3.2, Appendix 3. Overall the respondents felt that this attribute is fully addressed and there is a high level of agreement that it is of high importance; refer to Table 3.3.

All the job categories were in agreement with 98 % of the respondents that the morale of employees is important. Overall it is felt that this attribute is

fully addressed and there is a high level of agreement that it is of high importance; refer to Table 3.2. A mean of 4.40 (standard deviation = 0.59, indicating agreement of responses) was calculated.

3.6.3 Factor 3 and 4 – Risk awareness and taking

Both risk awareness and taking is highly relevant to a health and safety culture, especially when risk affects intentions indirectly through subjective norms and attitudes associated with behaviour (Harvey *et al.*, 2002:21). It further implies that health and safety may be improved by both risk homeostasis theory and behavioural decisions theory through changing risk-taking behaviours and habits rather than risk perceptions or evaluation. Tables 3.4 and 3.5 summarises the responses to these factors. Detail analysis of these attributes are reflected in Appendix A3 (2), Graphs A3.5 - A3.6.

TABLE 3.4: FACTOR 3 – RISK AWARENESS

Attribute	Evaluation		Importance	
	Mean	SD	Mean	SD
1. Health and safety matters should take priority.	4.55	0.60	2.74	0.55
2. I would tell my supervisor if he/she was wrong.	4.03	0.92	2.22	0.68
3. I am a good judge of risk.	4.28	0.74	2.48	0.73
4. I can foresee hazards.	4.28	0.70	2.53	0.68
5. Employees are told when they do not follow good workplace safety and health practices.	3.98	0.69	2.52	0.66
6. Managers here try to plan ahead for changes that might affect the health and safety of employees.	3.69	0.90	2.24	0.63
7. Employees in this organisation are aware of the associated dangers and risks.	3.88	0.82	2.59	0.62
8. Top management in my department set clear goals for continual health and safety improvement.	4.02	0.85	2.48	0.68
9. People in my work unit analyse their work to look for ways of doing a job safer.	3.67	0.85	2.31	0.60
10. My supervisor shows complete trust in employees' ability to identify risks.	3.64	0.87	2.10	0.58

83 % of respondents agree there is high risk awareness in the company, with 9 % undecided and 8 % in disagreement. The maintenance job category felt that this attribute is fully addressed, whereas management, other, admin and production felt it is moderately addressed, refer to Table A3.3, Appendix 3. A mean of 3.99 (standard deviation = 0.76, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute is moderately addressed and there is a high level of agreement that it is of high importance; refer to Table 3.4. Areas for improvement includes; telling employees if they do not follow good work practices; planning ahead for changes that might affect the health and safety of employees; more awareness of associated dangers and risks; analysing work procedures looking for ways to work safer and demonstrating more trust in employees' ability to identify risks.

TABLE 3.5: FACTOR 4 – RISK TAKING OF SELF AND RESPONSE TO RISK RELATED BEHAVIOURS OF OTHERS

Attribute	Evaluation		Importance	
	Mean	SD	Mean	SD
1. I am willing to take risks if I know the consequences.	2.72	1.29	2.02	0.81
2. I would take small risks to get the job done.	2.66	1.13	1.90	0.77
3. I would cut corners to finish the work quicker.	1.71	0.86	2.21	0.79
4. Critical behaviours are defined and measured.	3.74	1.18	2.36	0.79
5. Slow workers are a nuisance.	2.79	1.02	1.60	0.65
6. I do not report a near miss.	1.86	0.98	2.36	0.81
7. Everyone recognises that health and safety excellence is never-ending.	3.84	0.93	2.22	0.65

Risk taking (Attributes 1, 2, 3 & 6)

All the job categories were in agreement with 63 % of respondents that they will not take risks and will report near misses, with 11 % undecided and 26 % in disagreement. Overall it is felt that this attribute is fully addressed and

there is a high level of agreement that it is of high importance; refer to Table 3.5.

Critical behaviours (Attributes 4)

67 % of respondents agree that critical behaviours are defined and measured, with 16 % undecided and 17 % in disagreement. The maintenance job category felt that this attribute is fully addressed, whereas other, admin and production felt it is moderately addressed and management that it has not been sufficiently addressed; refer to Table A3.4, Appendix 3. A mean of 3.74 (standard deviation = 1.18, indicating disagreement amongst responses) was calculated. Overall the respondents felt that this attribute is moderately addressed and there is a high level of agreement that it is of high importance; refer to Table 3.5.

Risks with slow workers (Attributes 5)

30 % of respondents agree that slow workers are a nuisance, with 29 % undecided and 41 % in disagreement. Overall all the job categories were in agreement that these workers are not a nuisance, refer to Table A3.4, Appendix 3. A mean of 2.79 (standard deviation = 1.02, indicating disagreement amongst responses) was calculated, and a medium priority was allocated to the issue; refer to Table 3.5.

Health and safety excellence is never-ending (Attributes 7)

76 % of respondents agree that critical behaviours are defined and measured, with 15 % undecided and 9 % in disagreement. The maintenance and production job categories felt that this attribute is fully addressed, whereas management, other and admin felt it is moderately addressed, refer to Table A3.4, Appendix 3. A mean of 3.84 (standard deviation = 0.93, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute is moderately addressed and there is a high level of agreement that it is of high importance; refer to Table 3.5.

3.6.4 Factor 5 – Job satisfaction

Literature listed job satisfaction as an important aspect in health and safety culture, especially in forming a positive culture. It can be closely linked and to some extent is a function of management style and commitment. Table 3.6 summarises the responses to this factor. Detail analysis of these attributes are reflected in Appendix A3 (2), Graphs A3.9 - A3.10.

TABLE 3.6: FACTOR 5 – JOB SATISFACTION

Attribute	Evaluation		Importance	
	Mean	SD	Mean	SD
1. Management work on a need-to-know basis.	2.93	1.25	1.74	0.71
2. I am interested in my job.	4.40	0.72	2.33	0.69
3. Supervisors trust operators.	3.14	0.87	2.14	0.71
4. I am satisfied with my job.	3.86	1.03	2.45	0.78
5. I will recommend my job to a friend.	3.69	1.10	1.91	0.68
6. Teams work closer now than before.	3.29	1.11	2.17	0.73
7. My job is quite simple and repetitive.	2.14	1.16	1.88	0.73
8. I have new and interesting things to do in my work.	3.97	0.79	2.14	0.61
9. My job challenges me.	3.95	1.10	2.48	0.71
10. The job requires me to do many different things at work, using a variety of skills and talents.	4.38	0.88	2.41	0.73
11. I know exactly what is expected from me.	4.02	0.71	2.57	0.60
12. People in my department are encouraged to try new and better ways of doing the job.	3.98	0.61	2.22	0.65

Management (Attributes 1)

38 % of respondents agree that management work on a need-to-know basis, with 17 % undecided and 45 % in disagreement. Expect for the admin job category the rest felt that management does not just work on a need-to-know basis; refer to Table A3.5, Appendix 3.

Supervisor trust (Attributes 3)

37 % of respondents agree that supervisors trust operators, with 45 % undecided and 18 % in disagreement. The production job category felt that this attribute is fully addressed, whereas admin felt it is moderately addressed and management, maintenance and other felt is has not been sufficiently addressed; refer to Table A3.5, Appendix 3. A mean of 3.14 (standard deviation = 0.87, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute has not been sufficiently addressed and there is a high level of agreement that it is of high importance; refer to Table 3.6.

Job interest (Attributes 2, 4 & 5)

Some 13 % of respondents disagreed that they were satisfied and 16 % would not recommend their job to friends, interesting enough only 2 % of respondents indicated that they are not interested in their jobs. There might be some existence of an unhappy minority, perhaps 15 % of employees, for whom the culture is not right.

Job content (Attributes 7, 8, 9, 10, 11 & 12)

77 % of the respondents disagree that their job is simple and repetitive; corresponding with 85 % of the respondents agreeing that they have new and interesting things to do, that they are encouraged to try new and better ways of doing their work and that they know exactly what is expected of them. 91 % agree that their job is challenging, by using a variety of skills and talents.

Although the admin job category indicated that attributes 7, 8, 9, & 10 have not been fully addressed, the rest were all in agreement that this attribute is moderately to fully addressed. Only the other and administration job categories indicated that attribute 11 is fully addressed; the rest were all in agreement that it is moderately addressed; refer to Table A3.5, Appendix 3.

Overall the respondents felt that this attribute is fully addressed and there is a high level of agreement that it is of high importance; refer to Table 3.6.

3.6.5 Factor 6 – Responsibility

Different perceptions regarding the employer and employee's responsibility towards a health and safety culture exists in industry; therefore it is important to determine if this factor can hinder the company's health and safety culture. Table 3.7 summarises the responses to this factor. Detail analysis of these attributes are reflected in Appendix A3 (2), Graphs A3.11 - A3.12.

TABLE 3.7: FACTOR 6 – RESPONSIBILITY

Attribute	Evaluation		Importance	
	Mean	SD	Mean	SD
1. Management is initiating health and safety efforts that are self-opinionated.	3.03	1.09	1.93	0.70
2. There is evidence of a long-term commitment to health and safety matters.	3.98	0.81	2.26	0.72
3. Managers issue orders to implement new ideas and suggestions.	3.55	0.92	2.10	0.61
4. Safety improvement orders take priority.	3.76	0.94	2.28	0.74
5. There are no significant shortcuts taken when workplace safety and health are at stake.	3.84	0.89	2.24	0.71
6. Unskilled workers are used to perform skilled tasks on the plant.	2.53	1.16	2.48	0.71
7. I know the proper channels to route questions regarding health and safety practices.	4.19	0.71	2.14	0.69
8. People in my department know what is expected from them concerning health and safety.	4.10	0.87	2.28	0.67
9. It is my responsibility to ensure my workplace is healthy and safe before, during and after completion of a job.	4.34	0.61	2.47	0.65
10. My job requires me to use a number of complex or high-level skills.	4.00	0.90	2.29	0.70
11. Safety is not only the responsibility of the company but also of the individual.	4.66	0.64	2.78	0.56
12. Where I work, new employees quickly learn that they are expected to follow good workplace safety and health practices.	4.12	0.65	2.48	0.71

Managers initiate health and safety efforts that are self-opinionated (Attributes 1)

45 % of respondents agree that managers in fact do initiate health and safety efforts that are self-opinionated, with 19 % undecided and 36 % in disagreement. The maintenance job category felt that this attribute is moderately addressed, whereas the rest felt it has not been sufficiently addressed; refer to Table A3.6, Appendix 3. A mean of 3.03 (standard deviation = 1.09, indicating disagreement amongst responses) was calculated. Overall the respondents felt that this attribute has not been sufficiently addressed and that there is a high level of agreement that it is of medium importance; refer to Table 3.7.

Long-term commitment to health and safety (Attributes 2)

86 % of respondents agree that the company has a long term commitment to health and safety, with 7 % undecided and 7 % in disagreement. The management, maintenance and admin job categories felt that this attribute is fully addressed, whereas other and production felt it is moderately addressed; refer to Table A3.6, Appendix 3. A mean of 3.98 (standard deviation = 0.81, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute is moderately addressed and that there is a high level of agreement that it is of high importance; refer to Table 3.7.

Improvement ideas (Attributes 3 & 4)

71 % of respondents agree that health and safety improvement orders take priority when implementing new ideas and suggestions, with 15 % undecided and 24 % in disagreement. The maintenance job category felt that this attribute is fully addressed, whereas other, admin and production felt it is moderately addressed, and management themselves felt it has not been sufficiently addressed; refer to Table A3.6, Appendix 3. A mean of 3.7 (standard deviation = 0.93, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute is moderately

addressed and that there is a high level of agreement that it is of high importance; refer to Table 3.7.

Shortcuts (Attribute 5)

79 % of respondents agree that there are no significant shortcuts taken when workplace health and safety is at stake, with 8 % disagreeing. The production job category felt that this attribute is fully addressed, whereas management, maintenance and other felt it is moderately addressed, and admin felt it has not been sufficiently addressed; refer to Table A3.6, Appendix 3. A mean of 3.84 (standard deviation = 0.89, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute is moderately addressed and that there is a high level of agreement that it is of high importance; refer to Table 3.7.

Competency (Attribute 6)

48 % of respondents disagree but 23 % agree that unskilled workers are used to perform skilled tasks.

Employee / department responsibilities (Attributes 7, 8, 9, 11 & 12)

90 % of respondents agree that they know the proper channels to route questions regarding health and safety practices; 91 % agree that people in their departments know what is expected from them concerning health and safety; 95 % agree it's the employee's responsibly to ensure that his/her workplace is healthy and safe before and after completion of a job and that health and safety is the responsibility of both the employee and employer; and 88 % agree that new employees quickly learn their responsibility regarding health and safety practices. A mean of 4.18 (standard deviation = 0.71, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute is fully addressed and that there is a high level of agreement that it is of high importance; refer to Table 3.7.

3.6.6 Factor 7 – Complacency

Different perceptions regarding complacency attitudes exist in industry; therefore it is important to determine if this factor can hinder the company's health and safety culture. Table 3.8 summarises the responses to this factor. Detail analysis of these attributes are reflected in Appendix A3 (2), Graphs A3.13 - A3.14.

TABLE 3.8: FACTOR 7 – COMPLACENCY

Attribute	Evaluation		Importance	
	Mean	SD	Mean	SD
1. Health and safety is managed by reaction and quick fixes.	2.40	0.94	2.09	0.60
2. I am proud of the company's attitude with regard to health and safety.	4.22	0.94	2.55	0.71
3. Root cause determination and preventative actions occur but are the exception.	2.33	1.00	2.41	0.68
4. Awareness that loss prevention is hard and ongoing is occasionally seen.	2.66	0.95	2.00	0.59
5. Despite conflict and deadlines, I retain attention to a task.	3.59	0.84	2.29	0.75
6. My inner thoughts are matching my behaviour.	3.88	0.84	2.24	0.66

Management of health and safety (Attribute 1)

55 % of the respondents disagree but 23 % agree that health and safety is managed by reaction and quick fixes.

Company's attitude with regard to health and safety (Attribute 2)

82 % of respondents agree that they are proud of the company's attitude with regards to health and safety, with 6 % disagreeing. All the job categories except other felt that this attribute is fully addressed; refer to Table A3.7, Appendix 3. A mean of 4.22 (standard deviation = 0.94, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute is fully addressed and that there is a high level of agreement that it is of high importance; refer to Table 3.8.

Root cause analysis (Attribute 3)

60 % of the respondents agree that it is not the exception to determine root causes and implement preventative actions.

Loss prevention awareness (Attribute 4)

24 % of the respondents agree that loss prevention awareness is hard and ongoing and occasionally seen, with 50 % disagreeing.

Behaviour (Attribute 6)

83 % of the respondents agree that their inner thoughts match their behaviour, with 7 % disagreeing. The management job category felt that this attribute is fully addressed, whereas maintenance, other and production felt it is moderately addressed, and admin felt it has not been sufficiently addressed; refer to Table A3.7, Appendix 3. A mean of 3.88 (standard deviation = 0.84, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute is moderately addressed and that there is a high level of agreement that it is of high importance: refer to Table 3.8.

3.6.7 Factor analysis summary

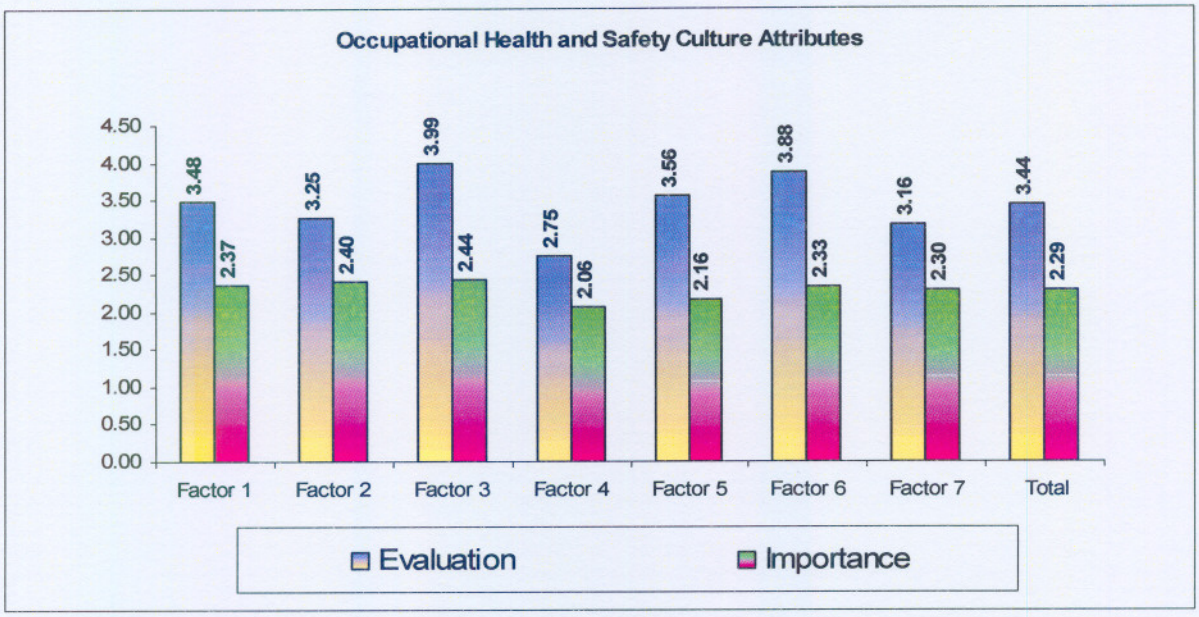
The critical success factors for an occupational health and safety culture have been identified and evaluated. Tables 3.9 - 3.10 and Graph 3.3 summarises the responses to these factors. Detail results are graphically presented in Appendix 2 Graphs A2.1 – A2.14 and Appendix 4 Tables A4.1 A4.2.

TABLE 3.9: PERCENTAGE RESPONSES OF HEALTH AND SAFETY ATTRIBUTES

Factor	Percentage responses (%)							
	Agreement responses					Importance responses		
	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree	Low	Medium	High
1. Management style and communication	5	20	13	47	15	12	43	44
2. Commitment, accountability and involvement	17	20	8	31	24	13	39	49
3. Risk awareness	2	6	9	58	25	10	38	52
4. Risk taking of self and response to risk behaviour of others	21	28	15	27	9	27	37	36
5. Job satisfaction	7	11	12	49	21	19	42	39
6. Responsibility	3	8	11	52	25	24	40	46
7. Complacency	12	18	21	37	11	14	46	40

TABLE 3.10: CRITICAL SUCCESS FACTORS OF A HEALTH AND SAFETY CULTURE

Factor	Evaluation			Importance	
	Mean	SD	Maturity	Mean	SD
1. Management style and communication	3.48	1.03	70 %	2.37	0.66
2. Commitment, accountability and involvement	3.25	1.01	65 %	2.40	0.66
3. Risk awareness	3.99	0.99	80 %	2.44	0.65
4. Risk taking of self and responses to risk-related behaviours of other	2.75	0.94	55 %	2.06	0.65
5. Job satisfaction	3.56	0.91	71 %	2.16	0.66
6. Responsibility	3.88	0.92	78 %	2.33	0.65
7. Complacency	3.16	0.90	63 %	2.30	0.64
Overall perception of the health and safety culture	3.44	**0.96**	69 %	2.29	**0.65**



GRAPH 3.3: SUMMARY CRITICAL SUCCESS FACTORS OF A HEALTH AND SAFETY CULTURE

Evaluating the above results it can be summarised that:

- 62 % of the respondents agree with the attributes listed in Factor 1. A mean of 3.48 (standard deviation = 1.03, indicating disagreement amongst responses) was calculated. Overall the respondents felt that this attribute has not been sufficiently addressed and that there is a high level of agreement that it is of high importance.

- 55 % of the respondents agree with the attributes listed in Factor 2. A mean of 3.25 (standard deviation = 1.01, indicating disagreement amongst responses) was calculated. Overall the respondents felt that this attribute has not been sufficiently addressed and that there is a high level of agreement that it is of high importance.

- 83 % of the respondents agree with the attributes listed in Factor 3. A mean of 3.99 (standard deviation = 0.99, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute has been moderately addressed and that there is a high level of agreement that it is of high importance.

- 36 % of the respondents agree with the attributes listed in Factor 4. A mean of 2.75 (standard deviation = 0.94, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute has not been sufficiently addressed and that there is a high level of agreement that it is of high importance.

- 70 % of the respondents agree with the attributes listed in Factor 5. A mean of 3.56 (standard deviation = 0.91, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute has been moderately addressed and that there is a high level of agreement that it is of high importance.

- 77 % of the respondents agree with the attributes listed in Factor 6. A mean of 3.88 (standard deviation = 0.92, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute has been moderately addressed and that there is a high level of agreement that it is of high importance.

- 58 % of the respondents agree with the attributes listed in Factor 7. A mean of 3.16 (standard deviation = 0.90, indicating agreement amongst responses) was calculated. Overall the respondents felt that this attribute has not been sufficiently addressed and that there is a high level of agreement that it is of high importance.

3.6.8 Health and Safety Culture Barometer

Table 3.11 reflects how the results of the survey were applied on the proposed health and safety culture barometer to determine the organisation's level of maturity.

TABLE 3.11: HEALTH AND SAFETY CULTURE BAROMETER

Safety Value	0 – Darkness Ignorance	1 – Dawn Entry level	2 – Mid Morning Novice	3 – Late Morning Mediocrity	4 – Noon Excellence	5 – Full Light Perfection
Do it for the right reasons	Safety driven by regulation, management directions and cost of accidents.	Concern for people occasionally mentioned but not backed up with actions. Employees don't believe it.	Flashes of real concern for people occur, but cynicism is ever-present.	Concern for people is balanced with compliance and injury costs but is seen as separate subject.	Concern for people is major safety driver but not in real harmony with goals.	Sincere concern for employees drives safety and is in perfect harmony with other activities.
Factor	**F1, A1**	**F1, A2**	**F1, A3**	**F1, A5**	**F1, A8**	
Conclusion	**3.81**	**2.59**	**3.22**	**3.10**	**2.88**	
See it as part of the whole	Safety is handled independently of the rest of the management process.	Safety is occasionally considered at staff meetings and during appraisals.	Efforts have been made to integrate safety, but they have been token and often failed.	Safety has parity with other staff functions, and management has a vision of how it should be integrated.	A plan to totally integrate safety exists. Independent safety discussions are becoming less frequent.	Loss prevention is totally integrated and accepted as essentials for business success.
Factor	**F2, A2**			**F2, A6**		
Conclusion	**2.49**			**3.62**		
Recognise there is no end.	Safety is managed by reaction and quick fixes.	Root cause determination and prevention efforts occur but are the exception.	Awareness that loss prevention is hard and ongoing is occasionally seen.	Management is initiating efforts that are self-perpetuating. Evidence of a long-term commitment to safety appears.	Critical behaviours and conditions are being defined and measured. A long-term commitment is evident.	Everyone recognizes that safety excellence is never-ending, like the Shewhart Cycle.
Factor	**F7, A1**	**F7, A3**	**F7, A4**	**F6, A1**	**F6, A2**	**F4, A7**
Conclusion	**2.40**	**2.33**	**2.66**	**3.03**	**3.98**	**3.84**

Adapted from: Eckenfelder (2003:36)

Not all the aspects as reflected in the proposed barometer were measured through the questionnaire. Those aspects that were measured evaluated Company X's health and safety culture profile as follows:

- **It is practiced for the right reasons.** The company's profile lies between level 0 – Darkness (ignorance) but more to level 2 - Mid morning (novice).
- **It is seen as part of the whole.** The company's profile lies at level 3 - Late morning (mediocrity).
- **It is recognised as having no end.** The company's profile lies between level 4 - Noon (excellence) and level 5 - Full light (perfection).

3.7 SUMMARY

This chapter started with a literature review regarding the research process including the methods for preparing a questionnaire and of gathering and analysing data for the empirical study.

One questionnaire was drawn up focussing on health and safety attributes in order to determine the current state of the company's health and safety culture. The questionnaire was used to determine those areas for continual improvement which will be discussed in the final chapter. Questionnaires were distributed to individuals involved in management, health and safety matters, production and maintenance activities. The responses received back on the questionnaire were 58 %.

The results of the empirical study were presented in tabular form using frequency distributions and a more detailed statistical technique to calculate the average value from all respondents as well as the standard deviation around the average. Results were also presented in a graphical form using pie, doughnut and bar charts. The details of each question were discussed and comments made on the culture as perceived at this moment at Company X. Conclusions from this study, and recommendations to address identified gaps, will be discussed in chapter 4.

CHAPTER 4
CONCLUSIONS AND RECOMMENDATIONS

4 CHAPTER 4: CONCLUSIONS AND RECOMMENDATIONS

4.1 INTRODUCTION

In this final chapter, conclusions and recommendations will be made relating to the objectives of the study. Initially the conclusions reached from the empirical study will be discussed, where after some recommendations will be made. These recommendations will be based on the following:

- The knowledge of experts and researchers as discussed in the literature study (Chapter 2).
- Results gained from the empirical investigation on the occupational health and safety culture (Chapter 3).

Finally, a brief evaluation will be done to confirm that the objectives of this study are met.

4.2 CONCLUSIONS BASED ON THE EMPIRICAL STUDY

A health and safety culture could be described as ideas and beliefs that all members of the organisation share about risk, accidents and incidents.

4.2.1 Maturity of Company X's occupational health and safety culture

From the awareness questionnaire's results, Chapter 3, Table 3.10 and Appendix 4, Table A 4.1, it is only the maintenance job category who feels that the maturity of the company's occupational health and safety culture (71% mature) is at a moderate level. The rest of the job categories (maturity level ranging between 65% – 69%) feel that it needs further attention as all attributes of the critical success factors have not been sufficiently addressed.

Priority should be given to the following critical success factors and their attributes:

- Risk taking of self and responses to risk-related behaviours of others (Factor 4, Table 3.5) (36% agreeing with attributes, measured a maturity level of 55 %).
- Complacency (Factor 7, Table 3.8) (58% agreeing with attributes, measured a maturity level of 63 %).
- Commitment, accountability and involvement (Factor 2, Table 3.3) (55% agreeing with attributes, measured a maturity level of 65 %).
- Management style and commitment (Factor 1, Table 3.2) (62% agreeing with attributes, measured a maturity level of 70 %).

Critical success factors which were identified as being moderately addressed but needing further refinement include:

- Job satisfaction (Factor 5, Table 3.6) (70% agreeing with attributes, measured a maturity level of 71 %).
- Responsibility (Factor 6, Table 3.7) (77% agreeing with attributes, measured a maturity level of 78 %).
- Risk awareness (Factor 3, Table 3.4) (83% agreeing with attributes, measured a maturity level of 80 %).

4.2.2 Occupational health and safety barometer

Results obtained from the assessment questionnaire were extrapolated on the proposed maturity grid called a health and safety culture barometer; Chapter 3, Table 3.11. The outcome revealed that Company X's health and safety culture profile:

- **Is practiced for the right reasons.** The company's profile lies between level 0 – Darkness / ignorance (*Safety driven by regulation, management directions and cost of accidents*) and level 2 - Mid morning / novice *(Flashes of real concern for people occur, but cynicism is ever-present).*

- **Is seen as part of the whole**. The company's profile lies at level 3 - Late morning / mediocrity *(Safety has parity with other staff functions, and management has a vision of how it should be integrated).*

- **Is recognised as having no end**. The company's profile lies between level 4 - Noon / excellence *(Critical behaviours and conditions are being defined and measured. A long-term commitment is evident)* and level 5 - Full light / perfection *(Everyone recognises that safety excellence is never-ending).*

4.2.3 Continuous improvement strategy

In order for a company to develop an appropriate improvement strategy it is necessary to identify where it and its employees are in terms of their cultural development. By applying the proposed continuous improvement strategy, specific needs can be identified to move the company and its employees along a continuum from a 'not interested' to an 'excellent' segment.

Taking into consideration all the measured results, and plotting the overall perception of Company X's occupational health and safety culture on the continuous improvement cycle model (employers and employees segment), Chapter 2, Tables 2.5 and 2.6, the company's development of its occupational health and safety culture, evaluated in the employer segment is placed in the **very good** category and the employee segment is placed between the **complier** and **advocate** categories.

4.2.4 Further consideration

In addition to the identified critical success factors which need further attention the following drivers and issues should be reemphasised to employees to enable the company to improve its health and safety culture.

- Place awareness emphasis on:
  - The result of poor performance on business cost (Factor 6).
  - Articulating arguments.
  - Having the ear of senior managers (Factor 1).
- Establish an environment in which employees are able to see various occupational health and safety issues as real business issues (Factor 7).
- Having access in house to high level expertise (Factor 2).
- Visible senior management commitment (Factor 1).
- Knowing what the issues are for effective management in the future (Factor 1).
- Delaying decisions to possibly consult everyone (Factor 4).
- Keeping tabs on all activities that are being done (Factor 2 & 6).
- Additional employee ownership (Factor 2).
- Involvement in the education of the next generation (Factor 2).
- Establishing exchange forums (Factor 3 & 7).

4.3 RECOMMENDATIONS

Taken all the results and identified gaps into consideration it is recommended that Company X invest time and energy into the implementation of a strategy for continuous improvement for an occupational health and safety culture. Such a strategy could consist out of the following elements:

4.3.1 Continuous Improvement

- **Assess the company's culture**, either by surveys, interviews, self-assessments and / or discussions about leadership success and challenges.
- Get **alignment and understanding** on the **impact** that identified gaps might have on organisational functioning and results.

- **Implement skills development workshops.** These workshops should typically address topics such as how the organisation functions, illustrating different leadership models and styles and the importance of this new initiative to build and improve an occupational health and safety culture.
- Identify improvement targets.
- Set up an evaluation network.
- Monitor and give frequent feedback to all employees.
- Implement supporting and advising (knowledge sharing) sessions.
- Evaluate the implemented process.
- Repeat the process with new developmental targets.

As part of the above strategy Company X's senior leadership must take the following points under consideration:

- **Align ideas and beliefs on a health and safety vision and objectives.** Clarification might be needed on:
  - What it means to lead with health and safety.
  - Best leadership practices.
  - The need for improvement.
- **Focus discretionary time on**:
  - Crucial tasks asking WHAT.
  - HOW the tasks are done.
- **Give accurate feedback.**

The typical change model that goes hand in hand with the above includes:

- **Defining**:
  - Best practise opportunities.
  - Critical behaviours / practises.
- **Developing personal action plans / items for self and the business unit.**

- Where and When.

- **Defining the measurement criteria, including**:
  - Observations.
  - Self-monitoring and tracking of the process.
- **Reviewing data with leadership.**
- **Refining the strategy.**
- **Determining the need to sustain the mechanism.**

4.3.2 Occupational health and safety barometer

The following **barometer** (i.e. set of 14 points, reflected in Table 4.1 are suggested as tools) as based on the continuous quality improvement model developed by W. Edwards Deming (Anon$_c$., 2004) is recommended to be used as an effective planning tool. Implementing the suggested conscious and strategic points should enrich and strengthen the company's culture. The barometer consists out of four phases namely:

Phase I - Breaking the cycle of mistrust.

Typical barriers to take note of might be:

- Meeting deadlines has priority over health and safety issues.
- Management is not visible in work areas – Lack of visible presence = lack of interest. Visibility is a symbol of the importance managers place on health and safety.
- Lack of concern for employee welfare – The importance of expressing that you care.
- Not keeping commitments.
- Lack of agreement on a common direction or standard = poor accountability – All enforce all rules.
- Poor accountability – All walk the talk, i.e. wearing personal protective equipment where required.

- Poor communication of important information – Never assume that letters, memos or reports have communicated important information. **"Information is not communication"**.
- Blame fixing, personal attack and retribution are the norm in handling conflict.
- Response and follow up to health and safety concerns is slow or non-existent.
- Fear in the workplace.

Phase II – Teaching the concepts.

Phase III – Teaching and using dialogue in the workplace.

Phase IV – Recognising results and people.

TABLE 4.1: CONTINUOUS IMPROVEMENT MODEL APPLIED TO OCCUPATIONAL HEALTH AND SAFETY

Occupational health and safety continuous improvement model	
No	**Point**
1	**Create constancy of purpose for the improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs** (Factor 1).
	The purpose of loyal customers is to increase market share, stay in business and provide jobs. Management can create a constant sense of purpose by: ▪ Formally stating vision and mission statement, objectives, strategies, policies, plans, meetings presentation, education and training. ▪ Informally having conversations, actions listed and implemented and follow-through.
2	**Adopt a new philosophy** (Factor 2).
	The typical characteristics foresee for a pro-active health and safety approach: ▪ The purpose of the health and safety program in the first place should be to prevent any accidents, incidents and illnesses. ▪ The emphasis is on zero-tolerance, but always anticipating possible accidents, incidents or illnesses. ▪ Responding in a coordinated manner when accidents, incidents or illnesses happen. Use facts to find root cause/s. ▪ Management style should reflect **caring**. ▪ Heavy reliance on proactive programs, training, accountability, instilling health and safety as a value in each worker. ▪ Heavy reliance on proactive methods to prevent injuries and reduce costs.

Occupational health and safety continuous improvement model	
No	**Point**
3	**Cease dependence on mass inspection to achieve quality** (Factor 5 & 6).
	It is not an effective strategy only to rely on walkabout health and safety inspections, because it only uncovers hazardous conditions and not procedures. If inspectors are not properly trained one would not gain the benefit from mass inspections. Proactive activities should rather include: ▪ Training. ▪ Meetings. ▪ Job hazard analysis. ▪ Recognition programs that reward appropriate behaviour (reporting, complying). ▪ Incident investigations. ▪ Health and safety improvement teams in each department.
4	**End the practice of awarding business on the basis of a price tag.**
	▪ Develop a close long-term working relationship with one or two suppliers. ▪ Help them improve their product in quality so that it meets the company's high standards. ▪ Have the suppliers come out to your workplace to better understand your needs. ▪ Have the supplier do some training if needed. ▪ Go to supplier's workplace; see how product is being made. ▪ Insist on high standards.
5	**Improve constantly and forever the system of production and service, improve quality and productivity, and thus constantly decrease cost** (Factor 4, 5 & 6).
	In order to ensure continuous improvement the company's **approach** to health and safety should be pro-active with a continual line-organisation focus on health and safety that is an equally important part of the production process as well as all other aspects. Instil the perception that health and safety is a subset of quality and that it's everyone's responsibility to build health and safety into their processes, and hold people accountable for it. Identifying and correcting hazards are merely "putting out fires" not solving the problem. **In order to make sure that health and safety problems are solved permanently**, one must go after common (root) causes in the system to effect permanent change in the system. As long as common causes remain, special causes will continue to result in accidents, incidents or illnesses.
6	**Institute training and retraining on the job** (Factor 7).
	If a worker is not trained properly, it increases variation (common causes) in the process. If training is not conducted by a competent person, again variation increases and the errors of the one person are transferred to the next. Variations continue to be high with increased change of accidents. Training should be done by a competent person, preferably the supervisor who must also oversee safe work and hold others accountable. If the supervisor does not have the expertise, he/she should get an expert to train, but the supervisor should be involved and

Occupational health and safety continuous improvement model	
No	**Point**
	learn how to do the training.
7	**Adopt and institute leadership** (Factor 1).
	The qualities of good leadership involve human qualities, i.e. care, inspire, motivate, work harder than the rest, etc. Managers and supervisors can display health and safety leadership, by: ▪ Leadership – health and safety is important – watch me. ▪ Recognition. ▪ Supplying best personal protective equipment. ▪ High quality training. ▪ Safe materials. ▪ Properly designed maintained equipment. ▪ Holding workers accountable. ▪ Providing counselling.
8	**Drive out fear, so that everyone may work effectively for the company** (Factor 2, 5 & 6).
	Management by fear is defeating the purpose of the company. Workers can't excel as long as they are worried about their very survival. If morale suffers production suffers. The following approach is required to drive out fear: ▪ Pro-active recognition. An unenlightened management should recognise the contribution of workers who report hazards, injuries, and comply with health and safety rules. Recognising it as professional behaviour is the desire and helpful to the purpose of the company. ▪ Managers and supervisors must be educated about the costs of accidents so they understand why these behaviours are important. ▪ Managers and workers at all levels must perceive/ receive benefits for these behaviours.
9	**Break out barriers between staff areas** (Factor 3, 4, 5 & 6).
	If hazards are detected in one department, all departments should hear about it so the company improves the system. Accidents, incidents and illnesses will decrease and everyone wins.
10	**Eliminate slogans, exhortation, and targets for the work force asking for zero defects and new levels of productivity** (Factor 1, 2, 6 & 7).
	It is not within the power of employees, alone, to achieve zero accidents because they do not control common causes for accidents. They control only their own personal behaviour. They make choices about reporting injuries, hazards, and complying with health and safety rules. They do not generally control policies, expectations, accountability, training, materials, tools, management styles, etc. A zero accident policy is unrealistic in traditional sense, because most companies can never reach it. The only realistic policy under a continual improvement plan is to set reduction targets, i.e. to improve the accident, incident or illness rates by 10 % in a year. Then

Occupational health and safety continuous improvement model	
No	**Point**
	systems are set up to do just those. If the goal is reached, everyone relaxes. Rates go back up and you get a cyclic rate. If you want to instil health and safety as a value - workers will make safe choices when no one is looking if they personally value health and safety. Values don't need to be stated on posters if they are properly internalised.
11	**Eliminate numerical quotas for the workforce, and eliminate management by objectives. Eliminate numerical goals for people in management. Substitute leadership** (Factor 1, 2 & 6).
	Focussing on results statistics, which we have little control over, causes little improvement. If we look only at results, we can only react to results, we do not control it. Look at variations in the process to improve the results. We have control over the process. Work on fixing what we can control. If we focus on continually improving the process, the results will take care of themselves. What we should measure is leadership activities. We have control over activities, i.e. ▪ Safety meetings. ▪ Training. ▪ Recognition. ▪ Setting a proper example. ▪ Accountability. ▪ Supplying needs. ▪ Incident investigations. ▪ Inspections, etc.
12	**Remove barriers that rob people of their pride of workmanship** (Factor 5).
	Performance appraisals assume workers work independently. This is never the case. All workers / managers are interdependent upon each other as suppliers / customers for quality / health and safety.
13	**Institute a vigorous program of education and self-improvement for everyone** (Factor 5).
	A vigorous program in health and safety education and self-improvement should include: ▪ Thorough initial orientation that includes clearly stated accountabilities. ▪ Rules are discussed. Workers learn **WHY** the rules are important. ▪ On-the-job training and retraining on a regular basis. If procedures are done frequently, supervisor feedback is needed. If procedure is done infrequently, practice is needed. ▪ Workers are expected to become experts in health and safety. ▪ Workers learn hazard identification and control principles. ▪ Workers attend external training. ▪ Workers participate in health and safety improvement teams. ▪ Workers do training. ▪ Workers are recognised for health and safety expertise.

Occupational health and safety continuous improvement model	
No	**Point**
14	Track action to accomplish the transformation to continuous health and safety **improvement** (Factor 1 & 2).
	Get everybody in the company to work to accomplish the transformation, as it is everybody's job. ▪ Top manager communicates expectations. ▪ Set up recognition, beliefs. ▪ Educate, educate, educate. ▪ Walk the talk.

4.3.3 Change model

As stated in the literature cultural change is an extremely difficult and long-term process. It requires time, and many of the expected improvement benefits from the process lag behind its implementation. Successful organisational change requires persistent leadership. It is therefore very important that this entire process is driven and co-ordinated by an appointed change agent. He/she must maintain communication to frontline employees and management throughout the implementation process of the continuous improvement strategy.

4.4 STUDY EVALUATION

4.4.1 Primary objective

The primary objective of this study "***to develop a strategy for continuous improvement of an Occupational Health and Safety culture that will provide Company X with a barometer that, if used, can be an effective planning tool and can help to provide clarity of thought"*** was achieved by the set of tools formulated in the recommendations suggested in section 4.3 above.

4.4.2 Secondary objective

The first (determining which segment the company or group of employees fall into) and second (identifying those attributes that is preventing further progress) objective was achieved through the detailed empirical study and presentation thereof in Chapter 3, as well as conclusions drawn from this data as presented in section 4.2 above. A detailed description of the attributes needing attention is listed in section 4.2.1 – 4.2.4 above.

The third, fourth and fifth objectives (considering how these attributes may be overcome, which of the identified attributes need to be applied and how the motivations for the specified group can be used to get further engagement in relation to the identified needs) were achieved from the conclusions drawn from the analysed data.

A continuous improvement strategy is suggested that, if implemented, it is possible to uplift Company X's occupational health and safety culture to an interdependent state.

4.5 RECOMMENDATIONS FOR FUTURE RESEARCH

With the view to test the recommended continuous improvement strategy it is suggested to:

- Extend this survey to include the views of all the employees. Only then one can for certain assume what the state of the organisation's culture with respect to health and safety is.
- This survey should be re-introduced after implementation of all the interventions to obtain a measure of the success of the gains in strengthening the health and safety culture.

- The attributes identified and applied must be reviewed from time to time to ensure that other parameters of a health and safety culture are included as suggested by literature.

- This study / survey could be extended to other organisations in order to find a benchmark. This will enable the company assessed in this study to identify additional management practises that could be considered for implementation to further strengthen the health and safety culture.

- In order to provide insight into deeper levels of Schein's typology on culture it is suggested that future research should incorporate a quantitative approach by using more intensive observations, focused interviews and self-analysis.

4.6 CONCLUSION

Traditionally health and safety management philosophies and practices have resulted in reductions in accident, incident and illness rates over the years, but it appears that further reductions will require new ideas. A shift in the way we think about health and safety is the answer.

It is necessary to develop and/or enhance a workplace culture where health and safety is treated as an everyday thing, not something you design a system for and then relegate to a manual. There must be an environment of good faith and trust between employers and employees, and a lack of retribution for speaking out. Managers must take ownership and they themselves should model health and safe behaviours in the workplace. Role modelling needs to be combined with a policy of zero tolerance for abuses of the health and safety policy. Workers taking short cuts with health and safety should be disciplined, or dismissed if they repeat the unsafe work practices.

To ensure that a company's occupational health and safety culture continually improve a holistic approach is required. In fostering a positive health and safety culture it is necessary for sustained management commitment, a sound health and safety policy, visible management support, allocation of sufficient resources, use of appropriate health and safety management techniques, health and safety training provision, fostering a 'no blame culture', and amongst others an organisational learning culture and persistence of purposes. The results of the above will imply that all people share similar perceptions and adopt the same positive attitudes towards health and safety.

A health and safety culture may be weakened if upper management considers employee health and safety as simply a priority as opposed to a true value. Making it a priority of management is generally thought to be less effective since priorities can be compromised to satisfy another goal such as productivity.

Continuous health and safety improvement is a management approach that:

- **Focuses** on meeting or beating **customer** expectations for process and product health and safety.
- Use **facts and analysis** rigorously in everyday health and safety decisions.
- **Benchmark** health and safety performance against "world-class" performances.
- Promotes effective **teamwork across** the organisation.
- **Recognises** outstanding health and safety performance.
- Helps people and systems to improve continuously using **information**.
- Fosters a culture of **continuous improvement** in workplace health and safety.
- Focuses on effective hazard **identification, correction** and accident, incident and illness **prevention** efforts.

As suggested in the performance map, Chapter 2, Figure 2.8, it is better to work upstream on beliefs and values than downstream on behaviours. The result instead is ephemeral.

Cultural re-engineering may generate strong resistance because it may be perceived as a threat by many in any organisation resulting in resistance, but it will help everyone. It is important to cultivate the health and safety culture, a subset of the overall organisational culture, because it is the key predictor to health and safety performance.

4.7 SUMMARY

The purpose of this chapter was to conclude the empirical study as described in Chapter 3 and to recommend to top management a continuous improvement strategy.

Based on the conclusions and the literature study in Chapter 2, a 14-point continuous improvement model is suggested as a tool to fill the gaps that were identified. Applying and implementing this model could further enhance the organisation's health and safety culture.

Implementing these recommendations must be carefully planned through involving as many role players as possible to ensure effective implementation.

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APPENDIXES

Appendix 1:	Assessment questionnaire
Appendix 2:	Detail analysis of respondents' feedback
Appendix 3(1):	Detail analysis of job categories per evaluated factor in table format
Appendix 3(2):	Graphical presentation of detail analysis per job categories
Appendix 4:	Summary of the factor results

APPENDIX 1: ASSESSMENT QUESTIONNAIRE

ASSESSMENT OF THE HEALTH AND SAFETY ATTITUDES IN AN INDUSTRIAL ENVIRONMENT

			SCORE					IMPORTANCE		
			I strongly disagree	I disagree	I neither agree nor disagree	I agree	I strongly agree	Low	Medium	High
1. Management Style and Communication	1.01	This company's health and safety program is driven by regulations, management direction and cost of accidents	◉	○	○	○	○	◉	○	○
	1.02	Concern for employees is occasionally mentioned but it is not backed up with actions.	◉	○	○	○	○	◉1	○2	○3
	1.03	Flashes or real concern for employees occur, but cynicism is ever present	◉	○	○	○	○	◉1	○2	○3
	1.04	Sufficient time and / or energy is committed to health and safety	◉	○	○	○	○	◉1	○2	○3
	1.05	Concern for employees is balanced with compliance and injury costs but it is seen as separate subjects	◉	○	○	○	○	◉1	○2	○3
	1.06	Within reason, people in this department can say what they want without fear of punishment	◉	○	○	○	○	◉1	○2	○3
	1.07	Managers listens to safety ideas and provide funds to implement it	◉	○	○	○	○	◉1	○2	○3
	1.08	Concern for employees is a major health and safety driver but it is not in real harmony with the goals	◉	○	○	○	○	◉1	○2	○3
	1.09	We are always under pressure to get things done	◉	○	○	○	○	◉1	○2	○3
	1.10	I am encouraged to make health and safety improvement suggestions	◉	○	○	○	○	◉1	○2	○3
	1.11	Managers here do a good job of communicating health and safety issues with employees	◉	○	○	○	○	◉1	○2	○3

			SCORE					IMPORTANCE		
			I strongly disagree	I disagree	I neither agree nor disagree	I agree	I strongly agree	Low	Medium	High
2. Commitment, Accountability and Involvement	2.01	We are all accountable for our own and the plant's health and safety	◉	○	○	○	○	◉	○	○
	2.02	Health and safety is handled independently from the rest of the management processes	◉	○	○	○	○	◉	○	○
	2.03	I should discuss health and safety matters with others	◉	○	○	○	○	◉	○	○
	2.04	Health and safety matters are not my role	◉	○	○	○	○	◉	○	○
	2.05	My health and safety ideas are ignored	◉	○	○	○	○	◉	○	○
	2.06	Health and safety has parity with other staff functions, and management has a vision of how it should be integrated	◉	○	○	○	○	◉	○	○
	2.07	The health and safety of workers is a high priority with management	◉	○	○	○	○	◉	○	○
	2.08	I do not want more responsibility with regards to health and safety	◉	○	○	○	○	◉	○	○
	2.09	Employees and management work together to ensure the safest and most healthful working conditions	◉	○	○	○	○	◉	○	○
	2.10	I should tell a person if they act in a wrong or unsafe manner	◉	○	○	○	○	◉	○	○
	2.11	Conventional safety is not important to me	◉	○	○	○	○	◉	○	○
	2.12	The morale of employees is important	◉	○	○	○	○	◉	○	○
3. Risk Awareness	3.01	Health and safety matters should take priority	◉	○	○	○	○	◉	○	○
	3.02	I would tell my supervisor if he/she was wrong	◉	○	○	○	○	◉	○	○
	3.03	I am a good judge of risk	◉	○	○	○	○	◉	○	○
	3.04	I can foresee hazards	◉	○	○	○	○	◉	○	○
	3.05	Employees are told when they do not follow good workplace safety and health practices	◉	○	○	○	○	◉	○	○
	3.06	Managers here try to plan ahead for changes that might affect the health and safety of employees	◉	○	○	○	○	◉	○	○
	3.07	Employees in this organisation are aware of the associated dangers and risks	◉	○	○	○	○	◉	○	○
	3.08	Top management in my department set clear goals for continual health and safety improvement	◉	○	○	○	○	◉	○	○
	3.09	People in my work unit analyse their work to look for ways of doing a job safer	◉	○	○	○	○	◉	○	○
	3.10	My supervisor shows complete trust in employees' ability to identify risks	◉	○	○	○	○	◉	○	○

			SCORE					IMPORTANCE		
			I strongly disagree	I disagree	I neither agree nor disagree	I agree	I strongly agree	Low	Medium	High
4. Risk Taking of self and responses to risk-related behaviour of others	4.01	I am willing to take risks if I know the consequences	◉	○	○	○	○	○	○2	○3
	4.02	I would take small risks to get the job done	◉	○	○	○	○	○	○2	○3
	4.03	I would cut corners to finish the work quicker	◉	○	○	○	○	○	○2	○3
	4.04	Critical behaviours are defined and measured	◉	○	○	○	○	○	○2	○3
	4.05	Slow workers are a nuisance	◉	○	○	○	○	○	○2	○3
	4.06	I do not report a near miss	◉	○	○	○	○	○	○2	○3
	4.07	Everyone recognises that health and safety excellence is never-ending.	◉	○	○	○	○	○	○2	○3
5. Job Satisfaction	5.01	Management work on a need-to-know basis	◉	○	○	○	○	○	○2	○3
	5.02	I am interested in my job	◉	○	○	○	○	○	○2	○3
	5.03	Supervisors trust operators	◉	○	○	○	○	○	○2	○3
	5.04	I am satisfied with my job	◉	○	○	○	○	○	○2	○3
	5.05	I will recommend my job to a friend	◉	○	○	○	○	○	○2	○3
	5.06	Teams work closer now than before	◉	○	○	○	○	○	○2	○3
	5.07	My job is quite simple and repetitive	◉	○	○	○	○	○	○2	○3
	5.08	I have new and interesting things to do in my work	◉	○	○	○	○	○	○2	○3
	5.09	My job challenges me	◉	○	○	○	○	○	○2	○3
	5.10	The job requires me to do many different things at work, using a variety of skills and talents	◉	○	○	○	○	○	○2	○3
	5.11	I know exactly what is expected from me	◉	○	○	○	○	○	○2	○3
	5.12	People in my department are encouraged to try new and better ways of doing the job	◉	○	○	○	○	○	○2	○3

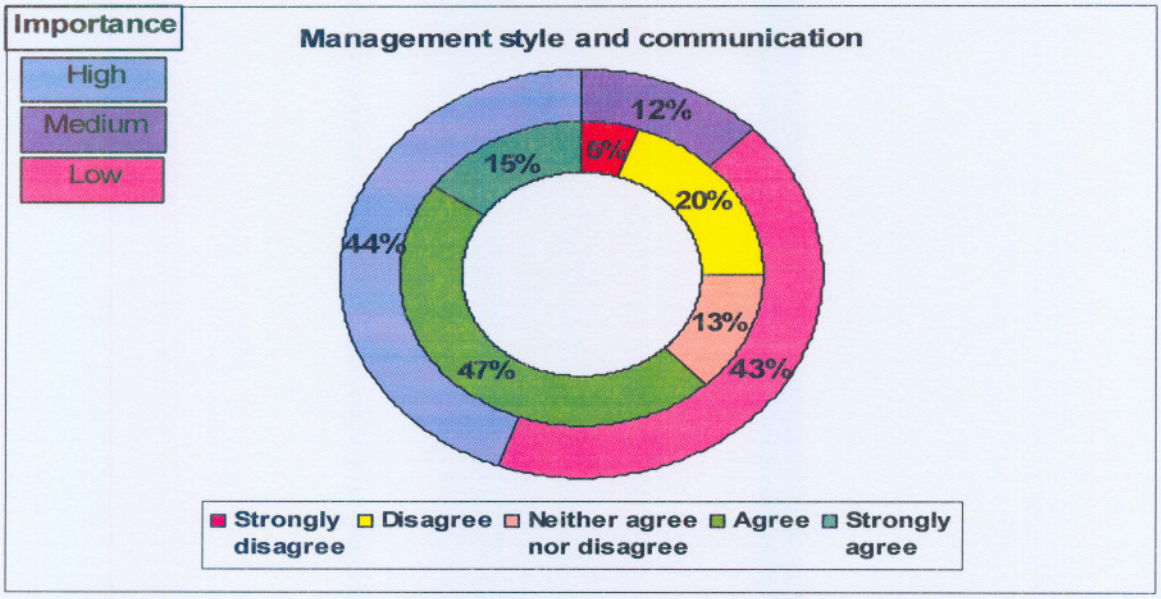
			SCORE					IMPORTANCE		
			I strongly disagree	I disagree	I neither agree nor disagree	I agree	I strongly agree	Low	Medium	High
6. Responsibility	6.01	Management is initiating health and safety efforts that are self-opinionated	◉	○	○	○	○	◉	○	○
	6.02	There is evidence of a long term commitment to health and safety matters	○	○	○	○	◉	◉	○	○
	6.03	Managers issue orders to implement new ideas and suggestions	◉	○	○	○	○	◉	○	○
	6.04	Safety improvement orders take priority	◉	○	○	○	○	◉	○	○
	6.05	There are no significant shortcuts taken when workplace safety and health are at stake	◉	○	○	○	○	◉	○	○
	6.06	Unskilled workers are used to perform skilled tasks on the plant	◉	○	○	○	○	◉	○	○
	6.07	I know the proper channels to route questions regarding health and safety practices	◉	○	○	○	○	◉	○	○
	6.08	People in my department know what is expected from them concerning health and safety	◉	○	○	○	○	◉	○	○
	6.09	It is my responsibility to ensure my workplace is healthy and safe before, during and after completion of a job	◉	○	○	○	○	◉	○	○
	6.10	My job requires me to use a number of complex or high-level skills	◉	○	○	○	○	◉	○	○
	6.11	Safety is not only the responsibility of the company but also of the individual	◉	○	○	○	○	◉	○	○
	6.12	Where I work, new employees quickly learn that they are expected to follow good workplace safety and health practices	◉	○	○	○	○	◉	○	○
7. Complacency	7.01	Health and safety is managed by reaction and quick fixes	◉	○	○	○	○	◉	○	○
	7.02	I am proud of the company's attitude with regards to health and safety	◉	○	○	○	○	◉	○	○
	7.03	Root cause determination and preventative actions occur but are the exception	◉	○	○	○	○	◉	○	○
	7.04	Awareness that loss prevention is hard and ongoing is occasionally seen	◉	○	○	○	○	◉	○	○
	7.05	Despite conflict and deadlines, I retain attention to a task	◉	○	○	○	○	◉	○	○
	7.06	My inner thoughts are matching my behaviour	◉	○	○	○	○	◉	○	○

Please complete below

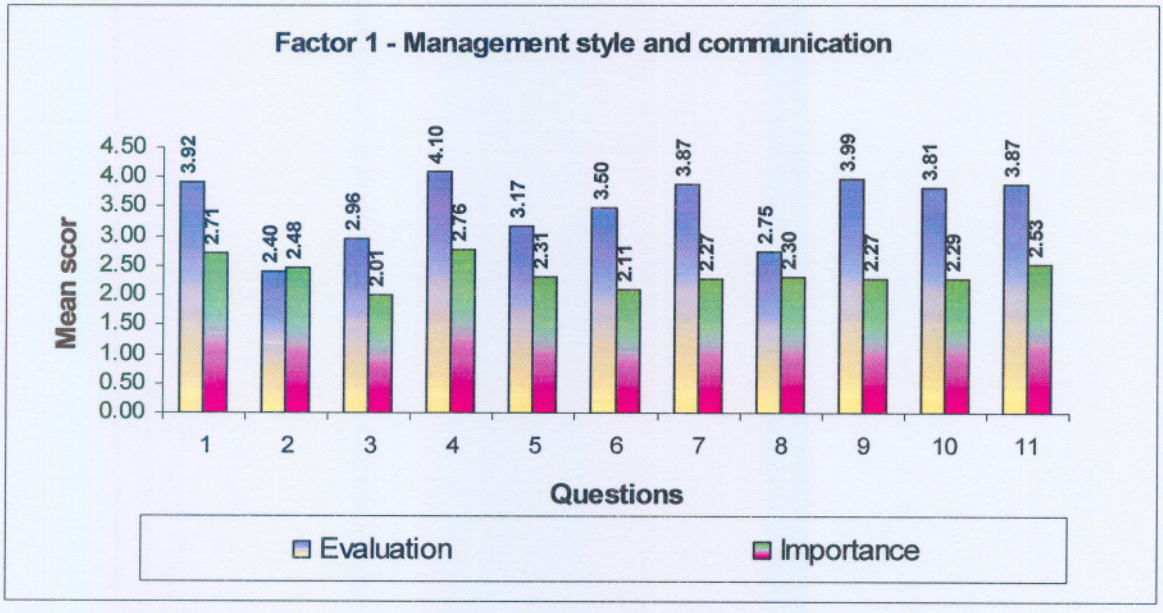
Business Unit	Location	Department
Other	Sasolburg	Other

APPENDIX 2: DETAIL ANALYSIS OF RESPONDENTS' FEEDBACK

A2.1 Management style and communication

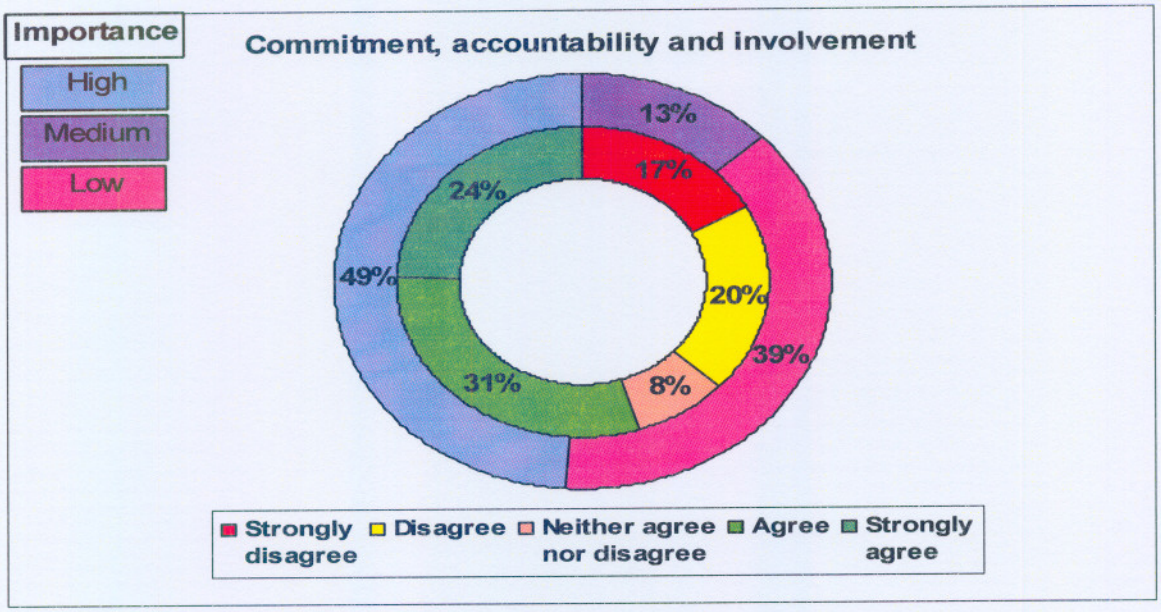


GRAPH A2.1: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 1

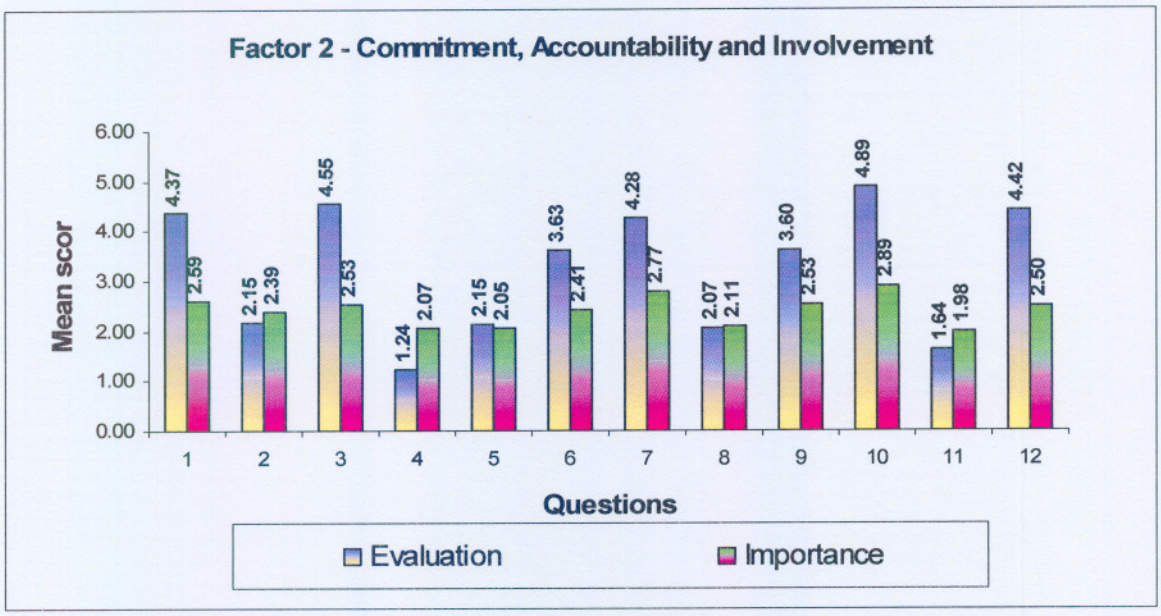


GRAPH A2.2: DETAIL ANALYSIS OF FACTOR 1'S RESULTS

A2.2 Commitment, accountability and involvement

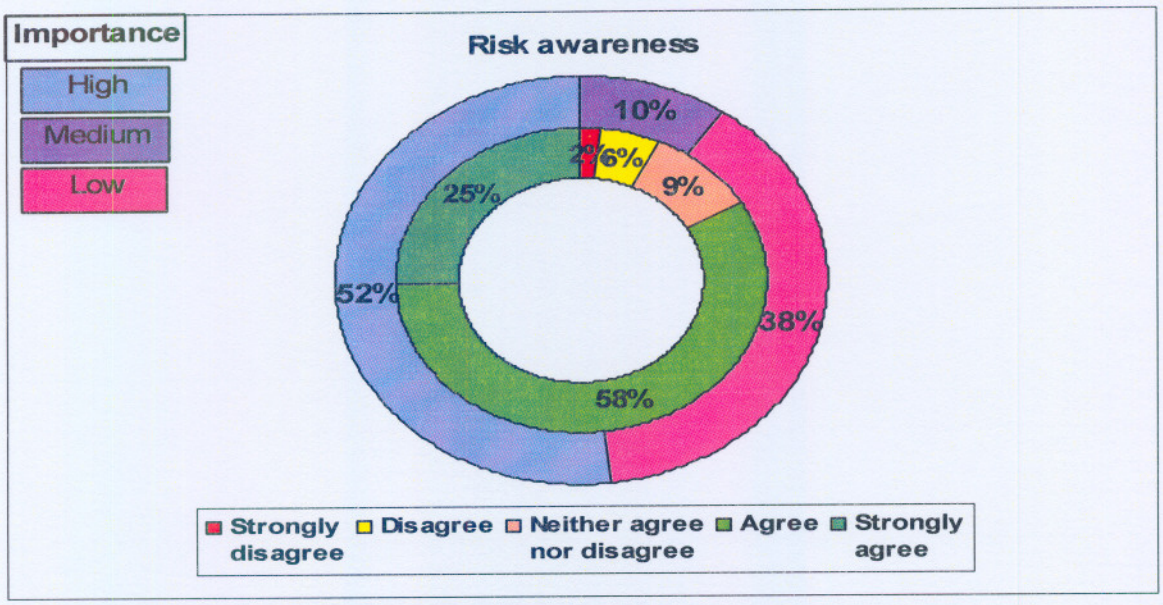


GRAPH A2.3: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 2

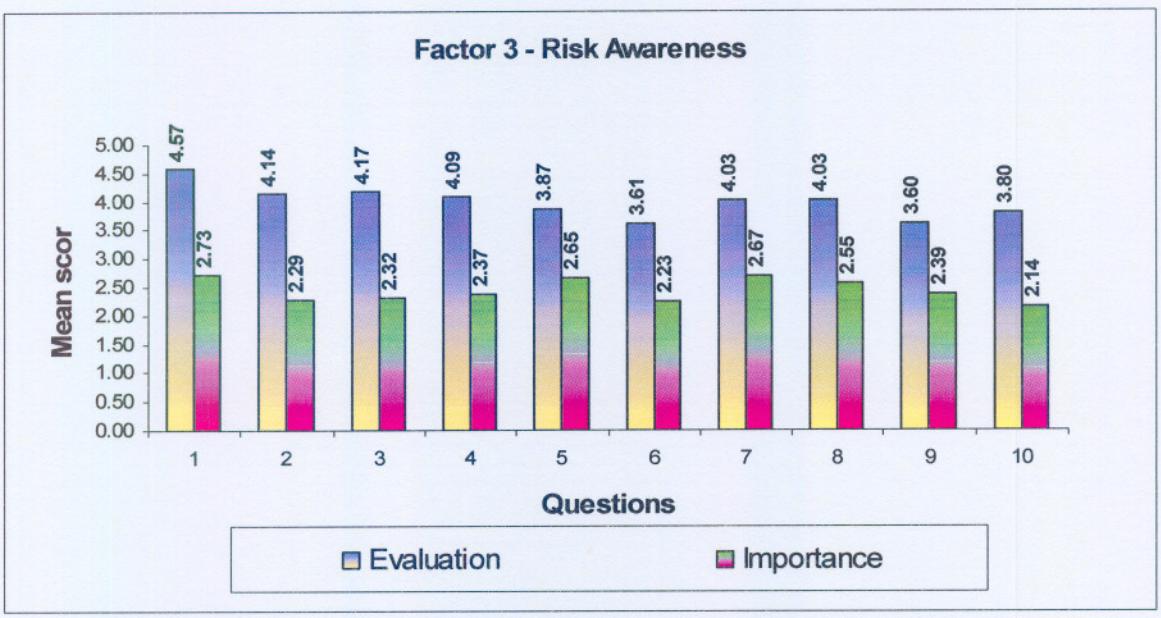


GRAPH A2.4: DETAIL ANALYSIS OF FACTOR 2'S RESULTS

A2.3 Risk awareness

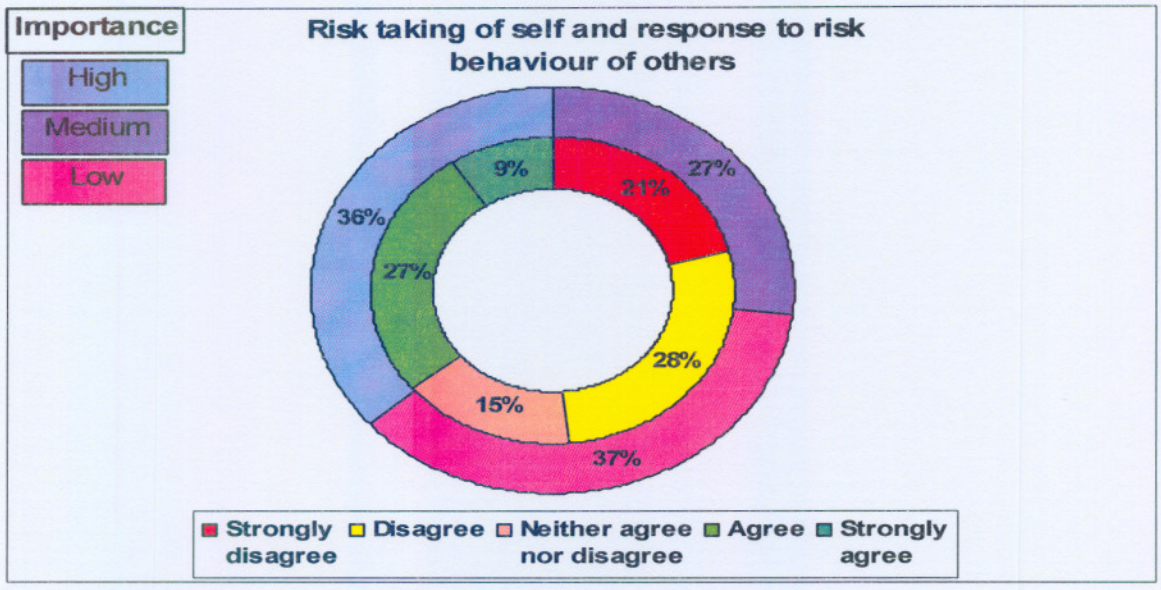


GRAPH A2.5: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 3

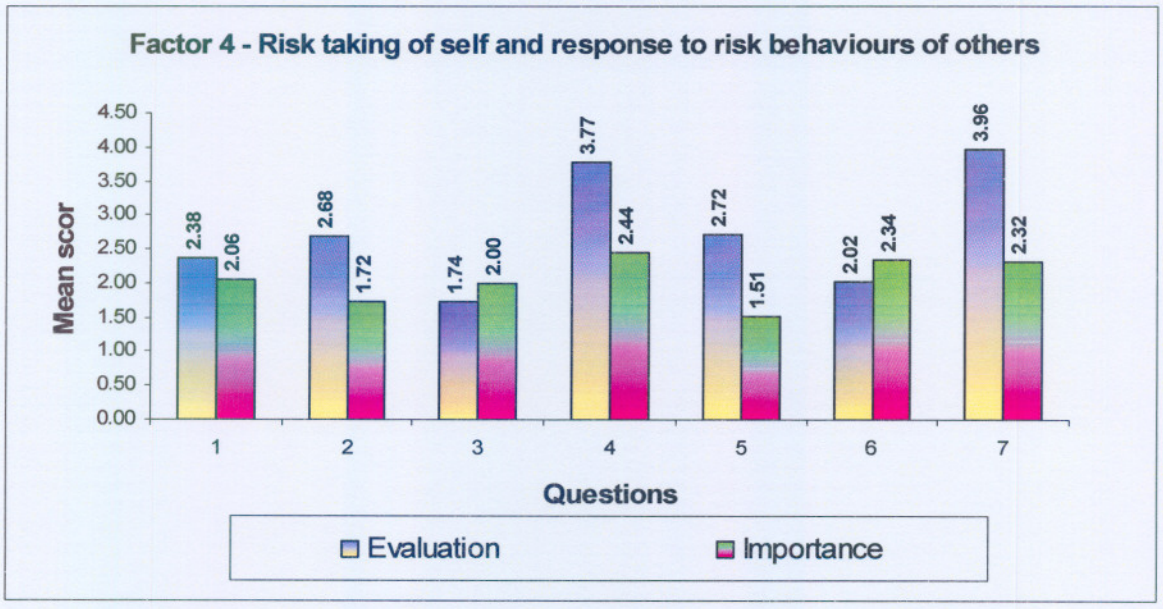


GRAPH A2.6: DETAIL ANALYSIS OF FACTOR 3'S RESULTS

A2.4 Risk taking of self and response to risk behaviour of others

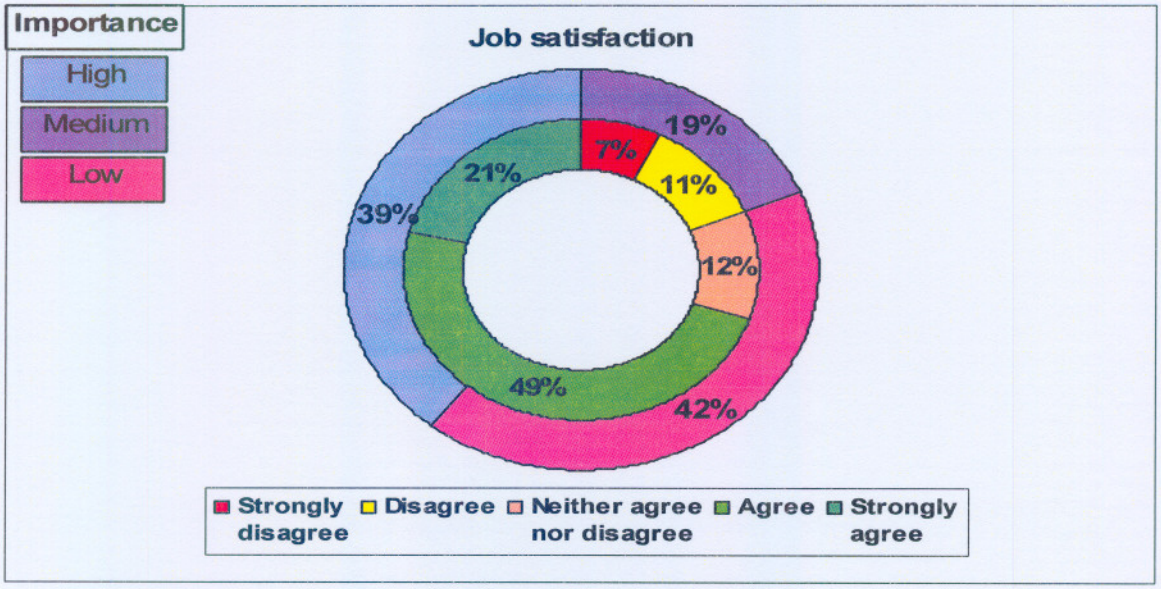


GRAPH A2.7: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 4

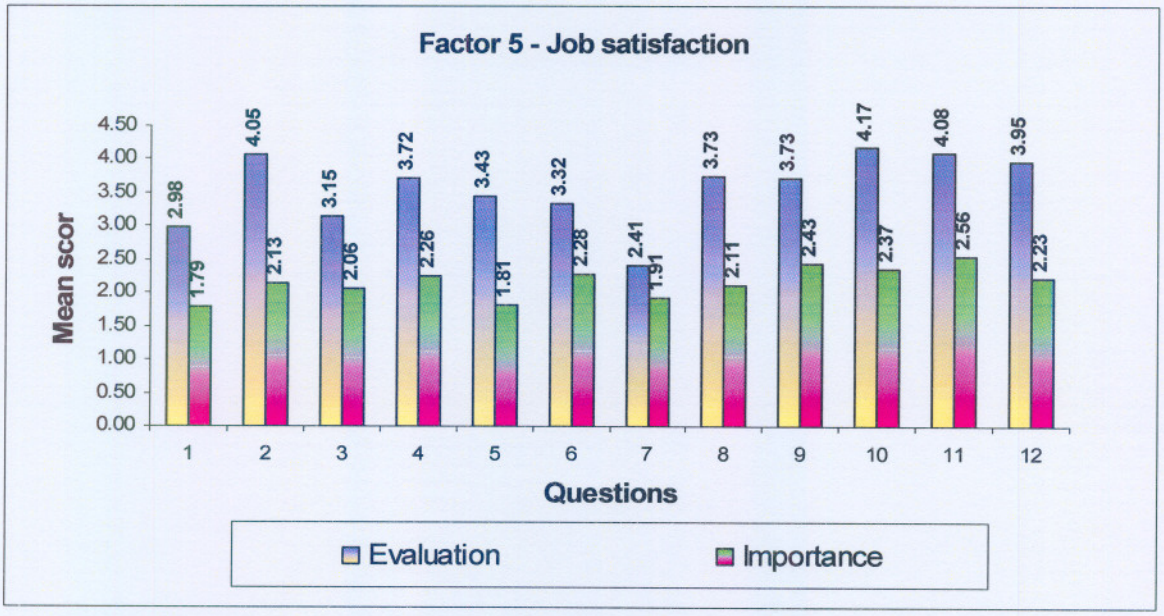


GRAPH A2.8: DETAIL ANALYSIS OF FACTOR 4'S RESULTS

A2.5 Job satisfaction

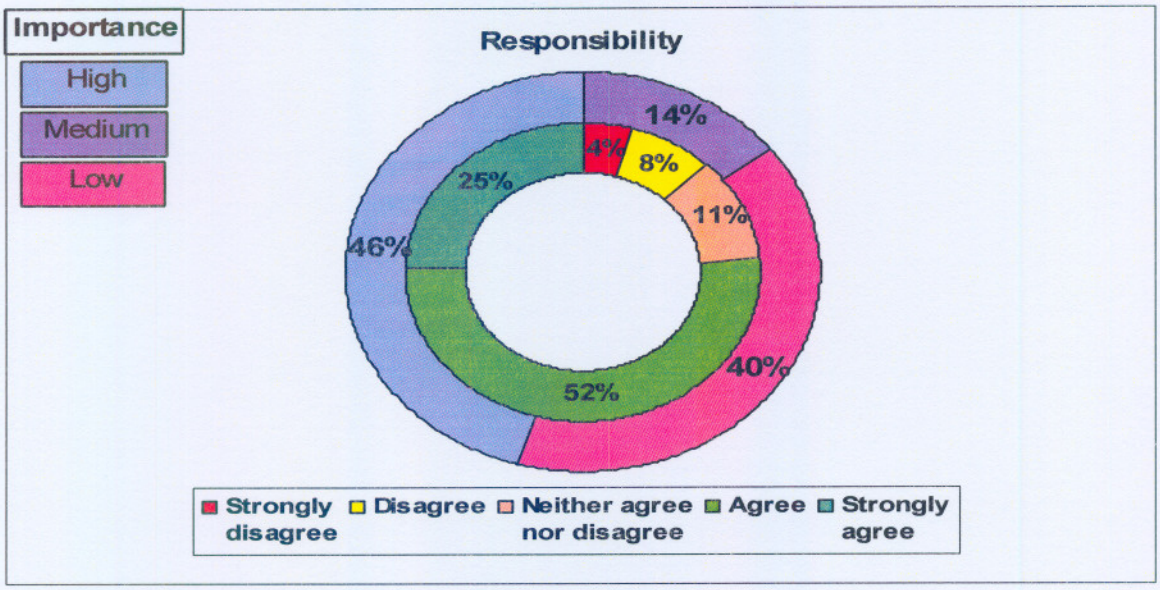


GRAPH A2.9: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 5

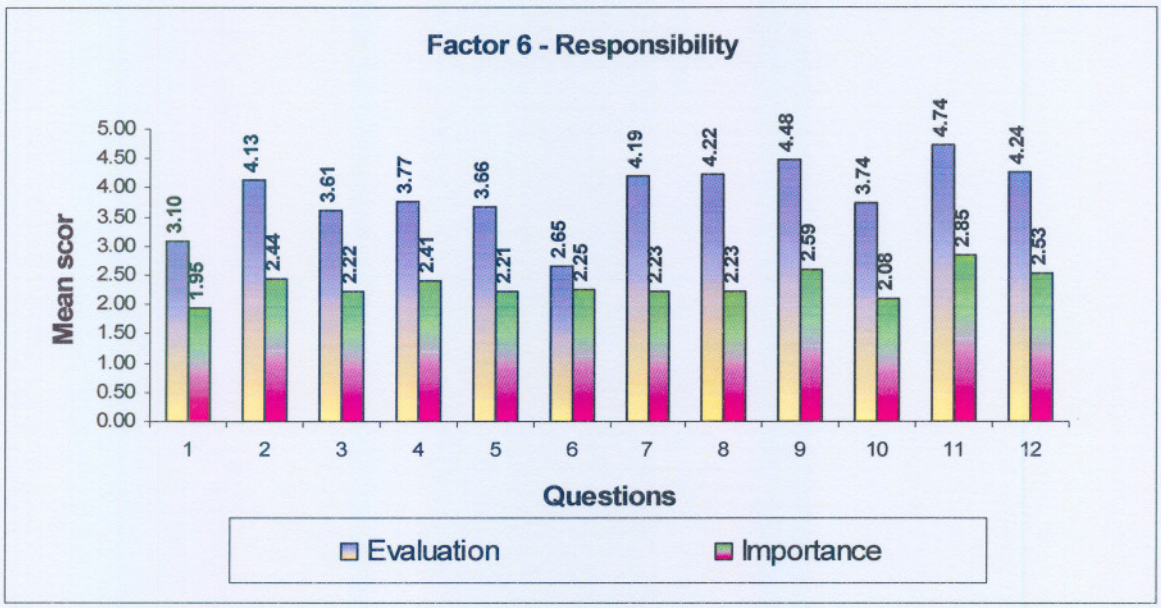


GRAPH A2.10: DETAIL ANALYSIS OF FACTOR 5'S RESULTS

A2.6 Responsibility

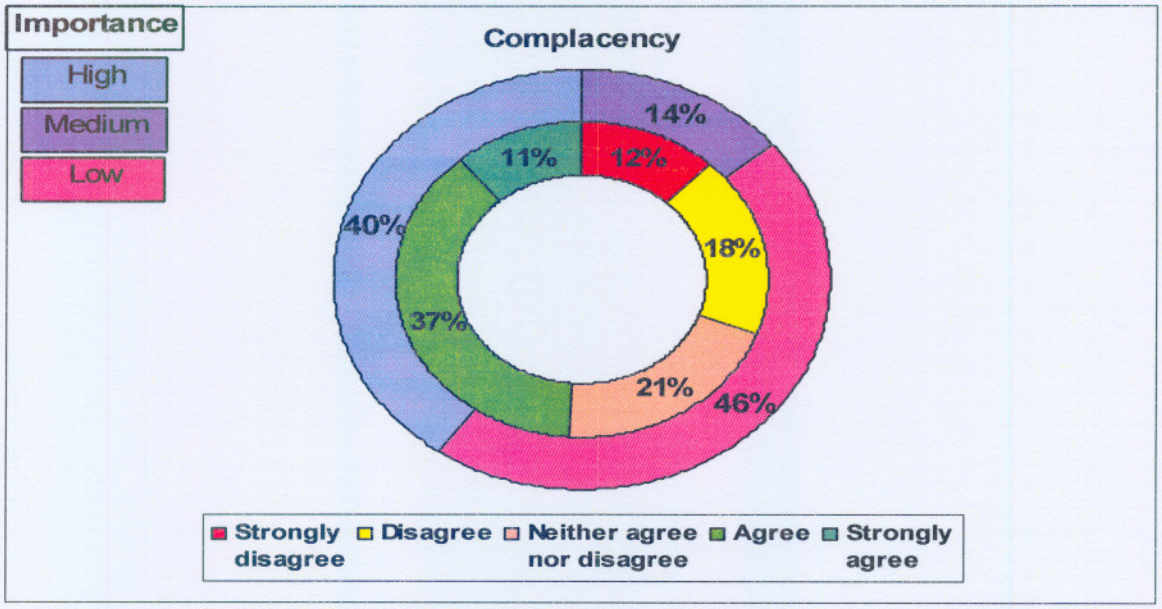


GRAPH A2.11: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 6

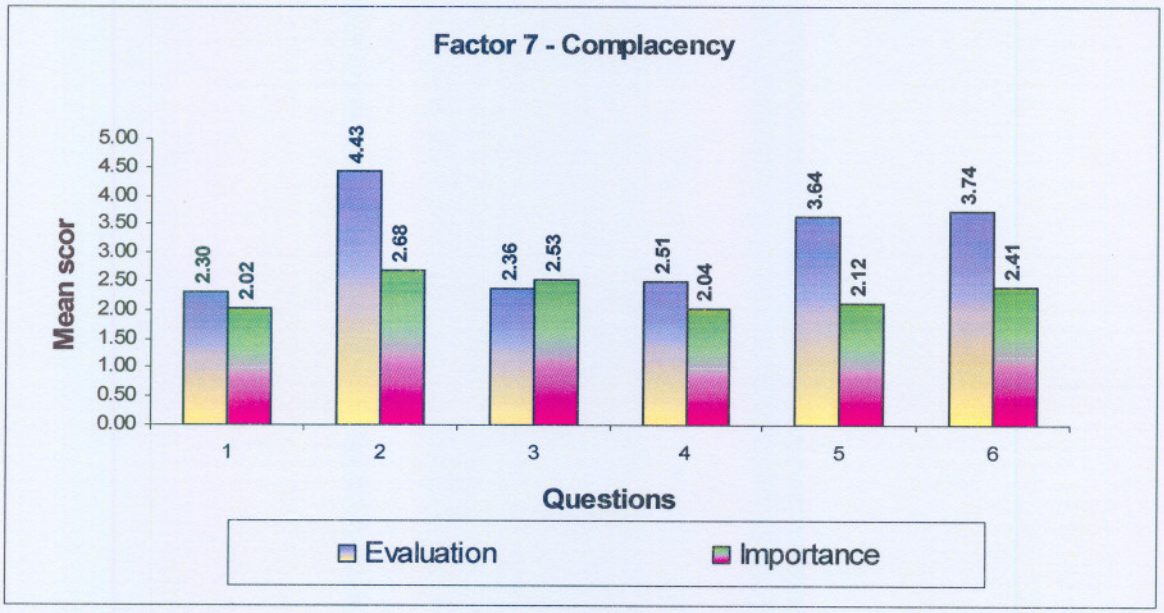


GRAPH A2.12: DETAIL ANALYSIS OF FACTOR 6'S RESULTS

A2.7 Complacency



GRAPH A2.13: RESPONSE DISTRIBUTION PERCENTAGE FOR FACTOR 7



GRAPH A2.14: DETAIL ANALYSIS OF FACTOR 7'S RESULTS

APPENDIX 3(1):DETAIL ANALYSIS OF JOB CATEGORIES PER EVALUATED FACTOR IN TABLE FORMAT

TABLE A3.1: FACTOR 1 - MANAGEMENT STYLE AND COMMUNICATION

Attribute	Evaluation					Importance				
	Mgt	M	O	A	P	Mgt	M	O	A	P
1. This company's health and safety program is driven by regulations, management direction and cost of accidents.	3.71	3.43	3.76	4.50	4.18	2.53	2.86	2.52	3.00	2.64
2. Concern for employees is occasionally mentioned but it is not backed up with actions.	2.06	2.00	3.19	2.00	2.73	2.71	2.57	2.43	2.50	2.18
3. Flashes or real concern for employees occur, but cynicism is ever present.	2.88	2.86	3.62	2.00	3.45	1.94	2.00	2.19	2.00	1.91
4. Sufficient time and / or energy is committed to health and safety.	3.94	4.57	3.38	4.5	4.09	2.71	2.86	2.52	3.00	2.73
5. Concern for employees is balanced with compliance and injury costs but it is seen as separate subjects.	2.94	3.00	3.14	3.50	3.27	2.18	2.57	2.14	2.50	2.18
6. Within reason, people in this department can say what they want without fear of punishment.	3.88	3.29	2.86	4.00	3.45	2.12	2.14	2.00	2.00	2.27
7. Managers listen to safety ideas and provide funds to implement it.	3.94	4.00	3.43	4.00	4.00	2.24	2.57	2.19	2.00	2.36
8. Concern for employees is a major health and safety driver but it is not in real harmony with the goals.	2.71	2.29	3.14	2.50	3.09	2.18	2.14	2.24	2.50	2.45
9. We are always under pressure to get things done.	4.18	3.71	4.10	4.50	3.45	2.12	2.57	2.29	2.00	2.36
10. I am encouraged to make health and safety improvement suggestions.	4.18	4.29	3.76	3.00	3.82	2.06	2.43	2.19	2.50	2.27
11. Managers here do a good job of communicating health and safety issues with employees.	3.41	4.43	3.62	4.00	3.91	2.35	2.57	2.38	3.00	2.36

TABLE A3.2: FACTOR 2 – COMMITMENT, ACCOUNTABILITY AND INVOLVEMENT

Attribute	Evaluation					Importance				
	Mgt	M	O	A	P	Mgt	M	O	A	P
1. We are all accountable for our own and the plant's health and safety.	4.18	4.00	4.38	5.00	4.27	2.65	2.86	2.81	2.00	2.64
2. Health and safety is handled independently from the rest of the management processes.	2.18	2.43	2.62	1.00	2.55	2.06	2.71	2.38	2.50	2.27
3. I should discuss health and safety matters with others.	4.47	4.43	4.48	5.00	4.36	2.35	2.57	2.43	2.50	2.82
4. Health and safety matters are not my role.	1.06	1.29	1.48	1.00	1.36	2.06	2.29	2.00	2.00	2.00
5. My health and safety ideas are ignored.	1.76	2.14	2.24	1.50	3.09	2.18	2.14	1.95	2.00	2.00
6. Health and safety has parity with other staff functions, and management has a vision of how it should be integrated.	3.29	3.86	3.76	3.50	3.73	2.12	2.43	2.14	3.00	2.36
7. The health and safety of workers is a high priority with management.	3.88	4.71	3.76	4.50	4.55	2.47	3.00	2.48	3.00	2.91
8. I do not want more responsibility with regards to health and safety.	2.35	2.00	1.95	1.50	2.55	2.00	2.14	2.05	2.00	2.36
9. Employees and management work together to ensure the safest and most healthful working conditions.	3.59	4.14	3.43	3.50	3.36	2.29	2.71	2.43	2.50	2.73
10. I should tell a person if they act in a wrong or unsafe manner.	4.76	5.00	4.86	5.00	4.82	2.65	3.00	2.90	3.00	2.91
11. Conventional safety is not important to me.	1.76	2.14	1.57	1.00	1.73	1.82	1.86	2.14	2.00	2.09
12. The morale of employees is important.	4.24	4.43	4.48	4.50	4.45	2.12	2.29	2.57	3.00	2.55

TABLE A3.3: FACTOR 3 – RISK AWARENESS

Attribute	Evaluation					Importance				
	Mgt	M	O	A	P	Mgt	M	O	A	P
1. Health and safety matters should take priority.	4.59	4.71	4.43	4.50	4.64	2.59	3.00	2.76	2.50	2.82
2. I would tell my supervisor if he/she was wrong.	4.06	4.29	3.95	4.50	3.91	1.94	2.29	2.29	2.50	2.45
3. I am a good judge of risk.	4.29	4.43	4.19	3.50	4.45	2.41	2.57	2.57	1.50	2.55
4. I can foresee hazards.	429	4.00	4.48	3.50	4.18	2.29	2.71	2.71	1.50	2.64
5. Employees are told when they do not follow good workplace safety and health practices.	3.76	4.43	4.05	3.00	4.09	2.29	2.86	2.48	3.00	2.64
6. Managers here try to plan ahead for changes that might affect the health and safety of employees.	3.53	4.00	3.71	3.00	3.82	1.94	2.43	2.33	2.00	2.45
7. Employees in this organisation are aware of the associated dangers and risks.	3.53	4.14	3.90	4.50	4.09	2.41	2.57	2.57	3.00	2.82
8. Top management in my department set clear goals for continual health and safety improvement.	4.12	4.29	4.00	4.00	3.73	2.24	2.86	2.43	2.50	2.73
9. People in my work unit analyse their work to look for ways of doing a job safer.	3.82	4.14	3.57	3.00	3.45	2.12	2.57	2.29	2.50	2.45
10. My supervisor shows complete trust in employees' ability to identify risks.	3.47	4.43	3.48	4.00	3.64	1.88	2.43	2.05	2.00	2.36

TABLE A3.4: FACTOR 4 – RISK TAKING OF SELF AND RESPONSE TO RISK-RELATED BEHAVIOURS OF OTHERS

Attribute	Evaluation					Importance				
	Mgt	M	O	A	P	Mgt	M	O	A	P
1. I am willing to take risks if I know the consequences.	2.59	2.43	3.05	1.00	2.82	2.00	1.71	2.10	2.50	2.00
2. I would take small risks to get the job done.	2.88	2.57	2.67	3.00	2.27	1.94	1.57	1.90	1.00	2.18
3. I would cut corners to finish the work quicker.	1.59	2.29	1.62	1.50	1.73	2.18	2.14	2.24	1.00	2.45
4. Critical behaviours are defined and measured.	3.41	4.29	3.76	3.50	3.91	2.12	2.86	2.38	2.50	2.36
5. Slow workers are a nuisance.	2.88	2.57	2.81	2.50	2.82	1.35	1.71	1.76	1.00	1.73
6. I do not report a near miss.	1.76	2.14	1.71	2.50	2.00	2.00	2.43	2.43	2.00	2.82
7. Everyone recognises that health and safety excellence is never-ending.	3.59	4.29	3.67	4.00	4.27	2.24	2.43	2.00	2.50	2.45

TABLE A3.5: FACTOR 5 – JOB SATISFACTION

Attribute		Evaluation					Importance				
		Mgt	M	O	A	P	Mgt	M	O	A	P
1.	Management work on a need-to-know basis.	2.53	2.71	3.33	3.50	2.82	1.59	1.71	1.76	2.00	1.91
2.	I am interested in my job.	4.59	4.43	4.48	2.50	4.27	2.35	2.57	2.29	1.00	2.45
3.	Supervisors trust operators.	3.12	2.71	3.24	3.50	3.18	1.94	2.29	2.14	1.50	2.45
4.	I am satisfied with my job.	3.88	3.71	3.81	3.00	4.16	2.35	2.86	2.43	1.00	2.64
5.	I will recommend my job to a friend.	3.82	3.71	3.52	2.00	4.09	1.82	2.29	1.88	1.00	2.09
6.	Teams work closer now than before.	3.41	3.9	3.24	3.50	3.18	1.94	2.43	2.14	2.50	2.36
7.	My job is quite simple and repetitive.	1.65	2.29	2.24	3.50	2.36	1.65	2.14	2.05	2.00	1.73
8.	I have new and interesting things to do in my work.	4.12	4.29	3.95	2.50	3.82	2.18	2.29	2.19	2.00	1.91
9.	My job challenges me.	4.12	4.29	3.90	2.50	3.82	2.24	2.86	2.82	2.00	2.45
10.	The job requires me to do many different things at work, using a variety of skills and talents.	4.53	4.71	4.33	3.00	4.27	2.24	2.71	2.52	2.00	2.36
11.	I know exactly what is expected from me.	4.00	3.86	4.05	4.50	4.00	2.53	2.57	2.57	2.50	2.64
12.	People in my department are encouraged to try new and better ways of doing the job.	3.82	4.29	3.95	3.50	4.18	2.24	2.57	2.14	2.00	2.18

TABLE A3.6: FACTOR 6 – RESPONSIBILITY

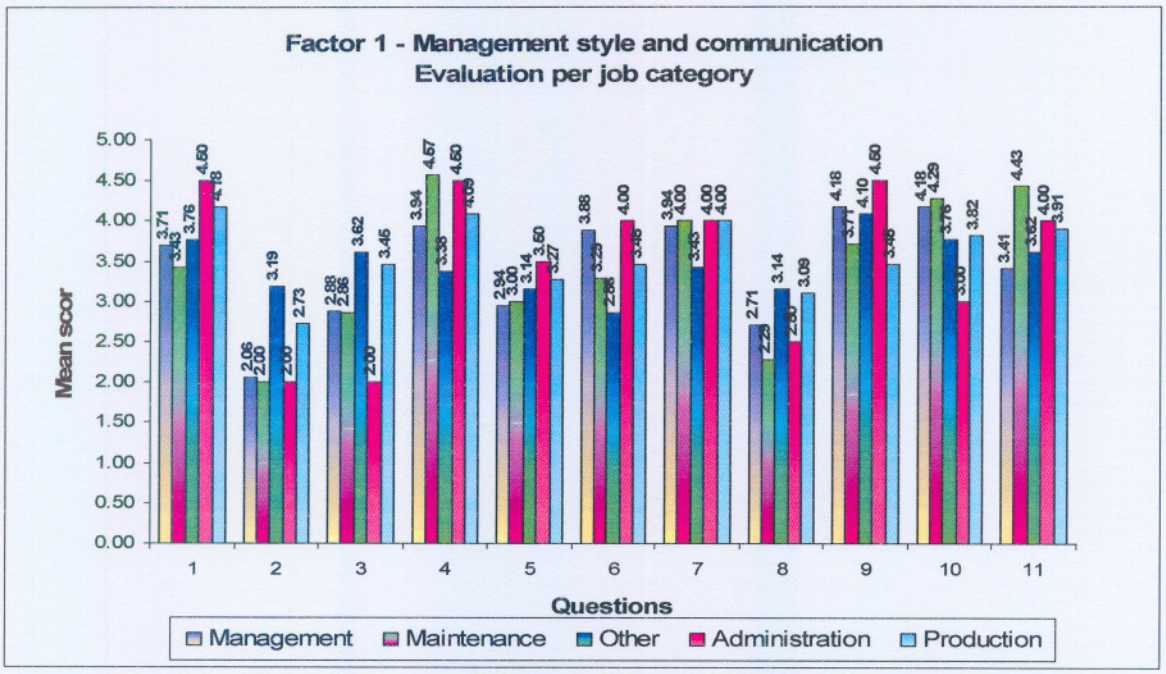
Attribute		Evaluation					Importance				
		Mgt	M	O	A	P	Mgt	M	O	A	P
1.	Management is initiating health and safety efforts that are self-opinionated.	2.59	3.71	3.19	3.00	3.00	1.71	2.57	1.88	1.50	2.09
2.	There is evidence of a long term commitment to health and safety matters.	4.18	4.29	3.67	4.50	4.00	2.29	2.57	2.14	3.00	2.18
3.	Managers issue orders to implement new ideas and suggestions.	3.18	4.14	3.62	3.50	3.64	2.12	2.43	1.95	2.50	2.09
4.	Safety improvement orders take priority.	3.65	4.14	3.67	3.50	3.91	2.29	2.43	2.24	3.00	2.09
5.	There are no significant shortcuts taken when workplace safety and health are at stake.	3.88	4.00	3.67	2.50	4.27	2.18	2.29	2.24	2.00	2.36
6.	Unskilled workers are used to perform skilled tasks on the plant.	2.29	2.29	2.81	3.50	2.36	2.47	2.71	2.52	1.00	2.55
7.	I know the proper channels to route questions regarding health and safety practices.	4.12	3.86	4.38	4.50	4.09	1.88	2.43	2.24	2.50	2.09
8.	People in my department know what is expected from them concerning health and safety.	3.76	4.43	4.14	4.50	4.27	2.29	2.29	2.29	2.00	2.27
9.	It is my responsibility to ensure my workplace is healthy and safe before, during and after completion of a job.	4.29	4.43	4.24	5.00	4.45	2.29	2.57	2.38	3.00	2.73
10.	My job requires me to use a number of complex or high-level skills.	3.8	4.14	4.19	2.50	4.00	2.24	2.57	2.43	1.00	2.18
11.	Safety is not only the responsibility of the company but also of the individual.	4.71	4.86	4.57	5.00	4.55	2.59	3.00	2.76	3.00	2.91
12.	Where I work, new employees quickly learn that they are expected to follow good workplace safety and health practices.	4.12	4.43	3.90	4.50	4.27	2.41	2.71	2.36	2.50	2.64

TABLE A3.7: FACTOR 7 – COMPLACENCY

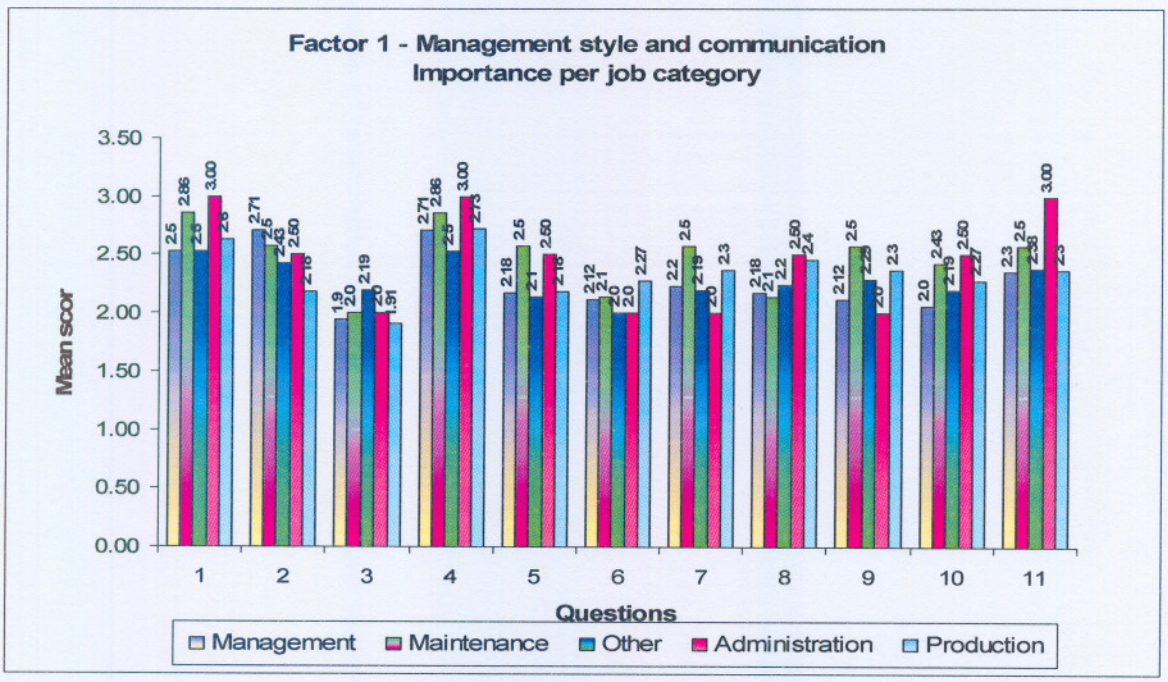
Attribute	Evaluation					Importance				
	Mgt	M	O	A	P	Mgt	M	O	A	P
1. Health and safety is managed by reaction and quick fixes.	2.00	2.43	2.81	2.00	2.27	1.88	2.29	2.14	1.50	2.27
2. I am proud of the company's attitude with regards to health and safety.	4.29	4.71	3.95	5.00	4.18	2.41	2.86	2.48	3.00	2.64
3. Root cause determination and preventative actions occur but are the exception.	2.18	2.43	2.43	2.50	2.27	2.24	2.57	2.48	3.00	2.36
4. Awareness that loss prevention is hard and ongoing is occasionally seen.	2.76	1.86	2.90	2.50	2.55	1.76	2.29	2.05	2.00	2.09
5. Despite conflict and deadlines, I retain attention to a task.	3.71	3.57	3.57	4.00	3.36	2.12	2.71	2.38	1.00	2.36
6. My inner thoughts are matching my behaviour.	4.12	4.00	3.76	3.00	3.82	2.12	2.57	2.19	3.00	2.18

APPENDIX 3(2): GRAPHICAL PRESENTATION OF DETAIL ANALYSIS PER JOB CATEGORIES

A3 (2).1 Management style and communication

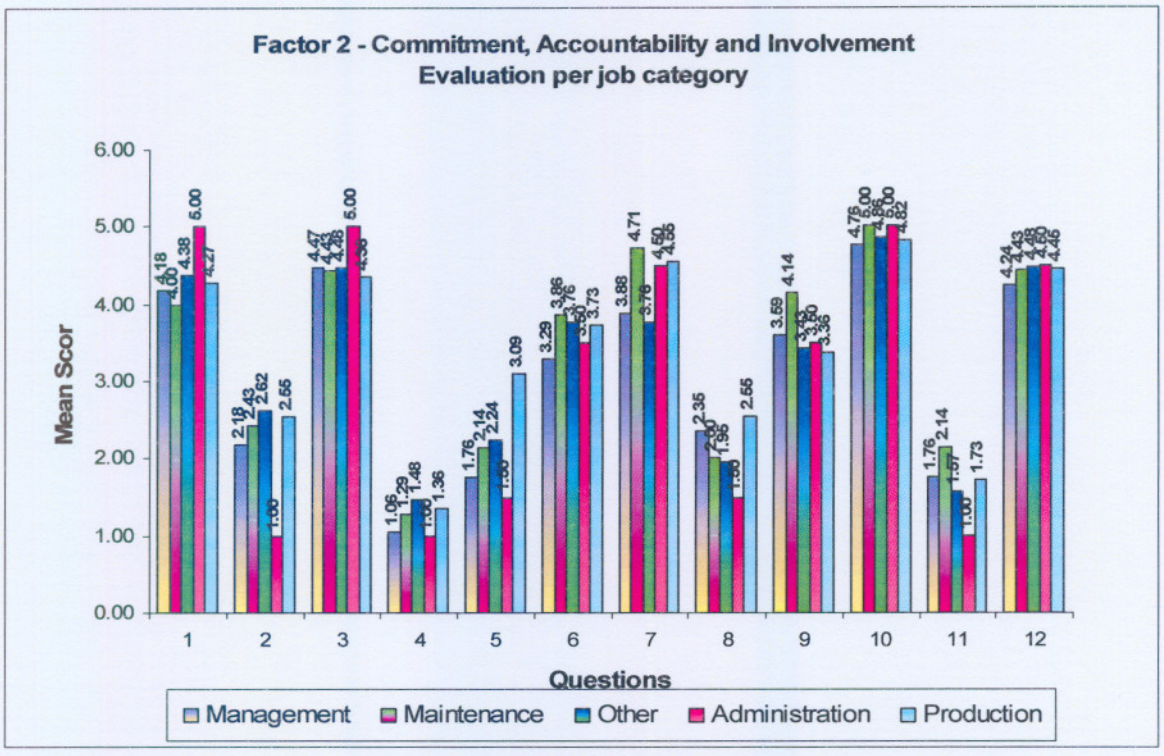


GRAPH A3.1: FACTOR 1 – EVALUATION PER JOB CATEGORY

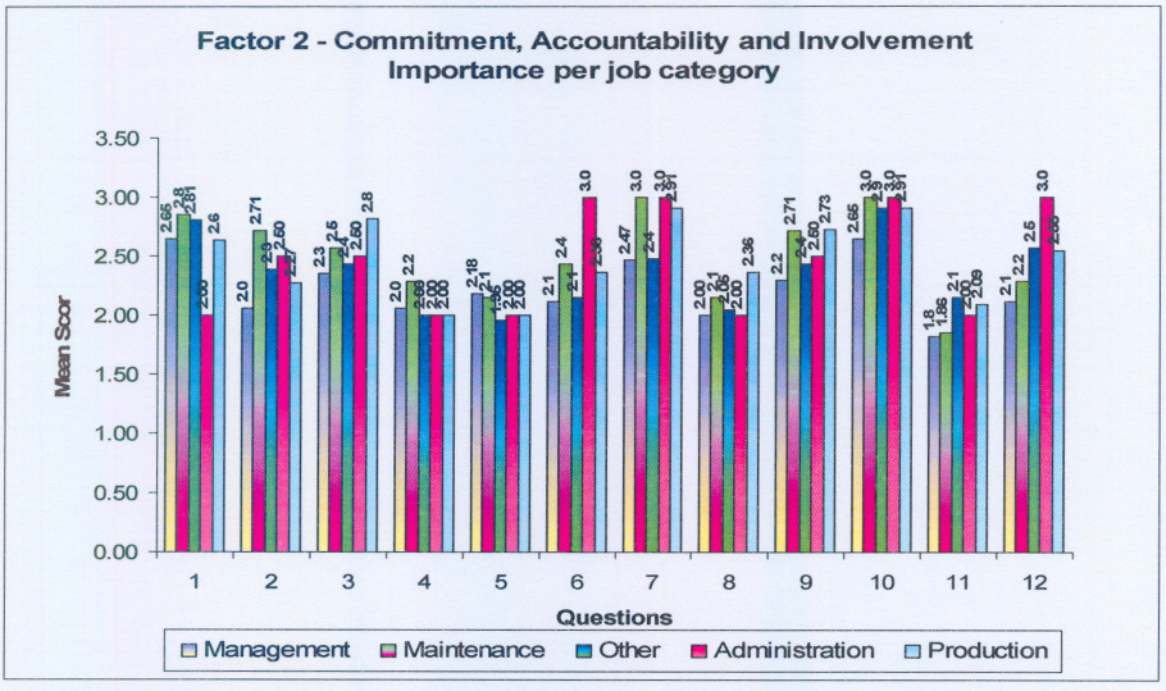


GRAPH A3.2: FACTOR 1 - IMPORTANCE PER JOB CATEGORY

A3 (2).2 Commitment, accountability and involvement

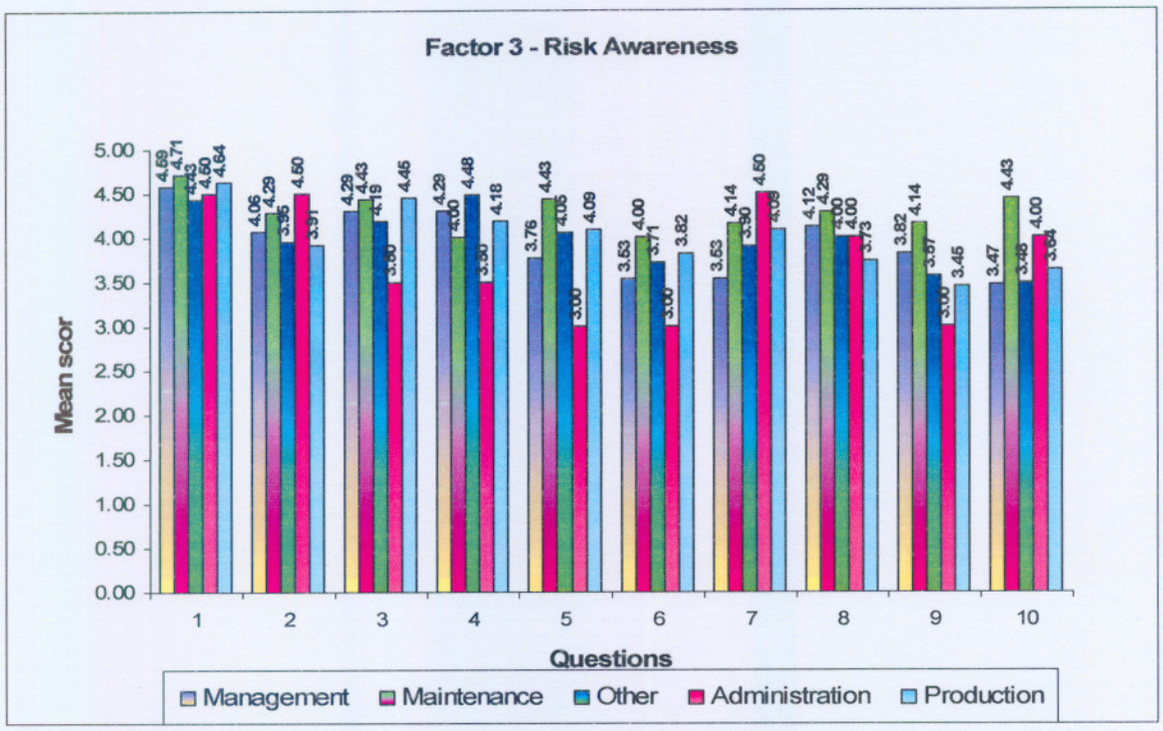


GRAPH A3.3: FACTOR 2 – EVALUATION PER JOB CATEGORY

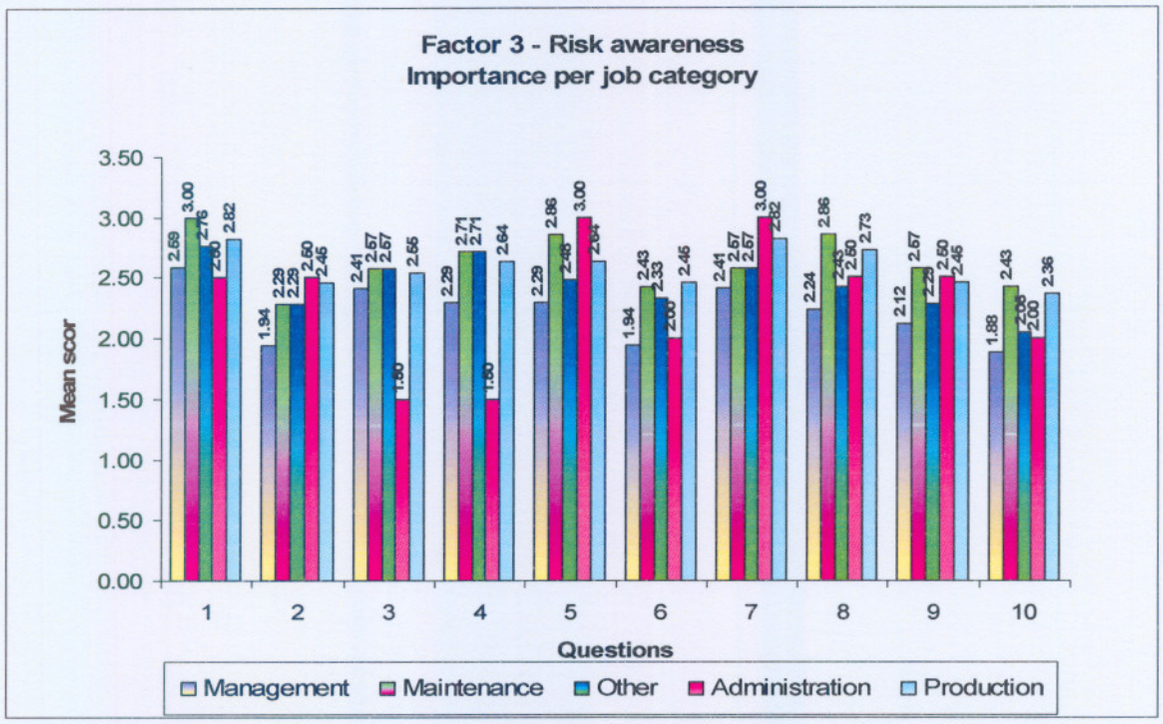


GRAPH A3.4: FACTOR 2 - IMPORTANCE PER JOB CATEGORY

A3 (2).3 Risk awareness

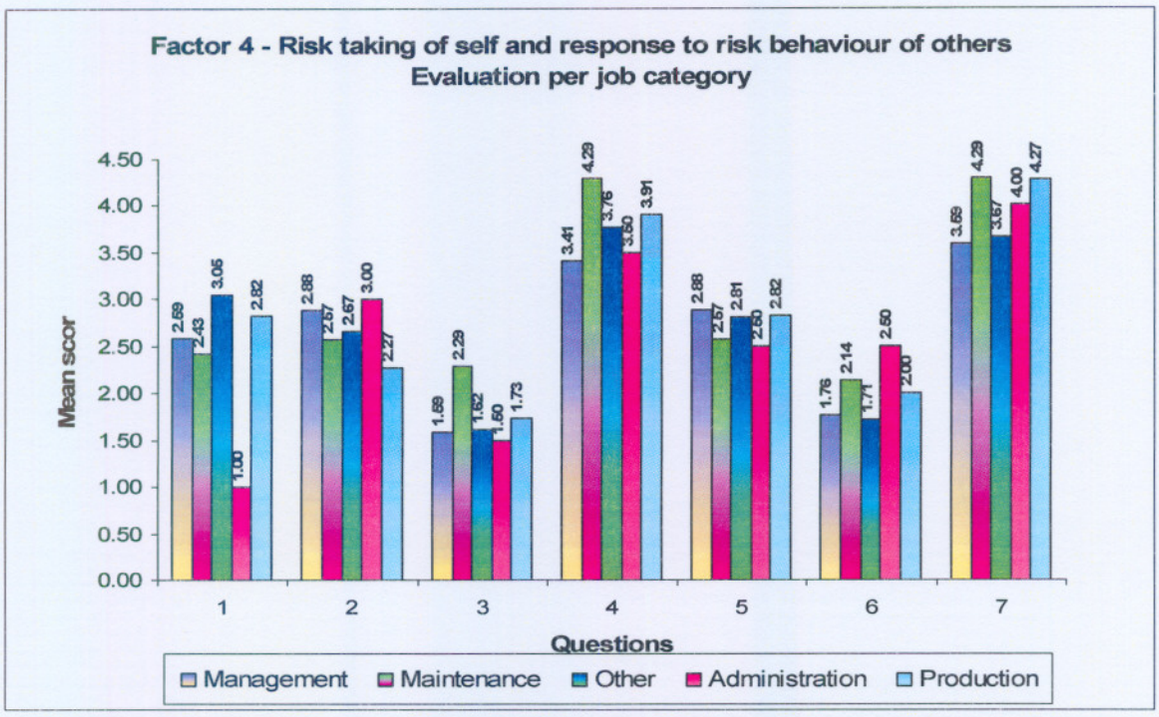


GRAPH A3.5: FACTOR 3 – EVALUATION PER JOB CATEGORY

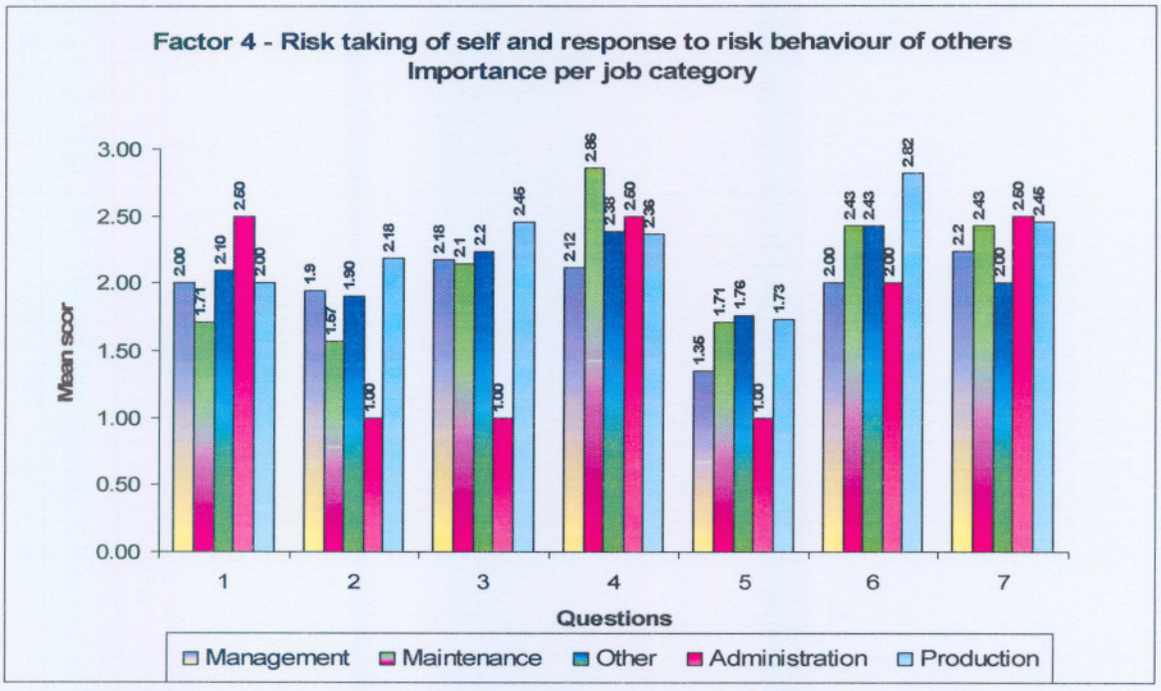


GRAPH A3.6: FACTOR 3 – IMPORTANCE PER JOB CATEGORY

A3 (2).4 Risk taking of self and response to risk behaviours of others

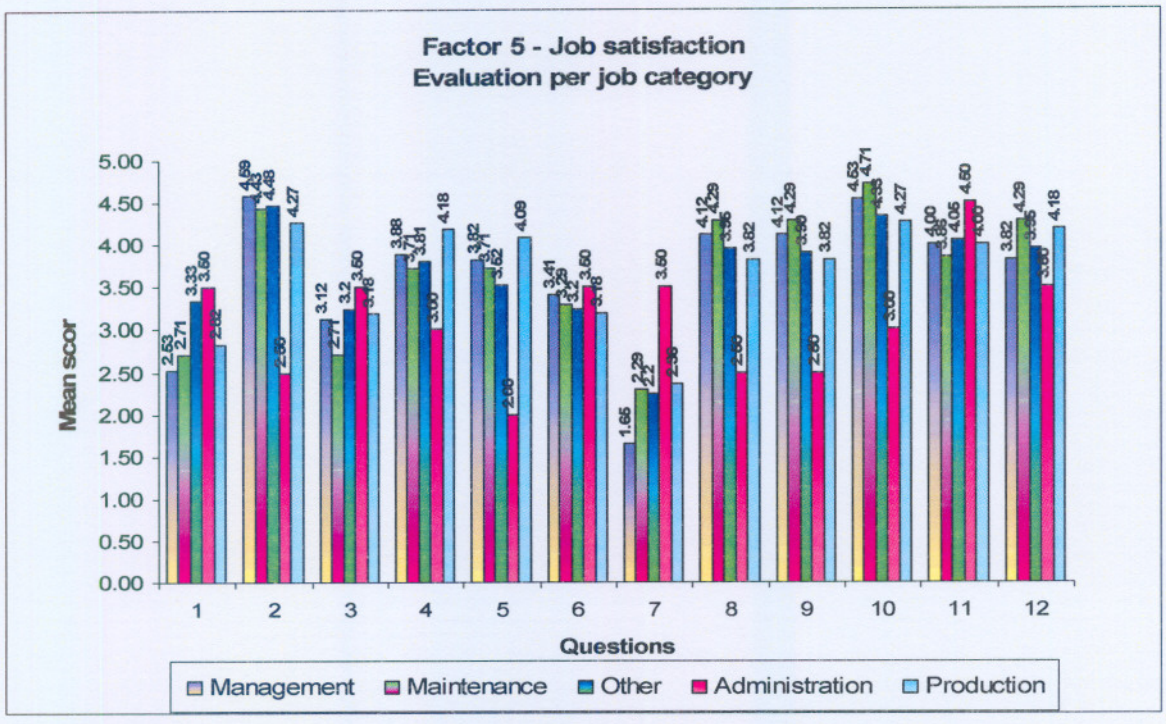


GRAPH A3.7: FACTOR 4- EVALUATION PER JOB CATEGORY

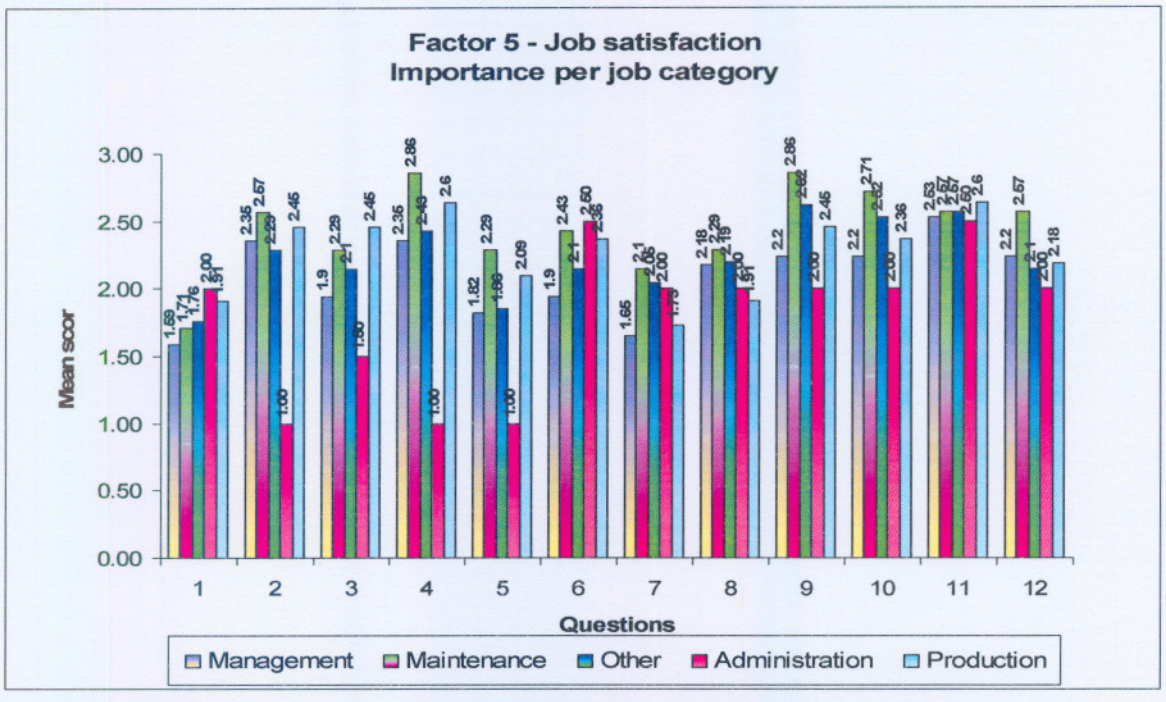


GRAPH A3.8: FACTOR 4- IMPORTANCE PER JOB CATEGORY

A3 (2).5 Job satisfaction

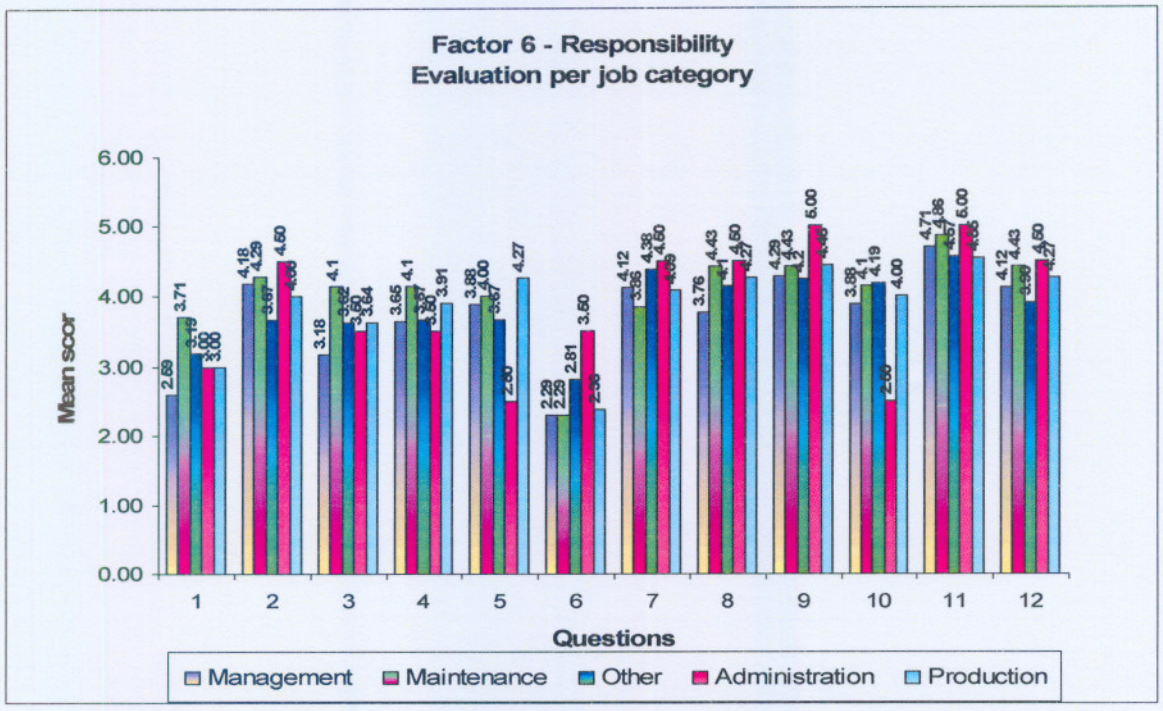


GRAPH A3.9: FACTOR 5- EVALUATION PER JOB CATEGORY

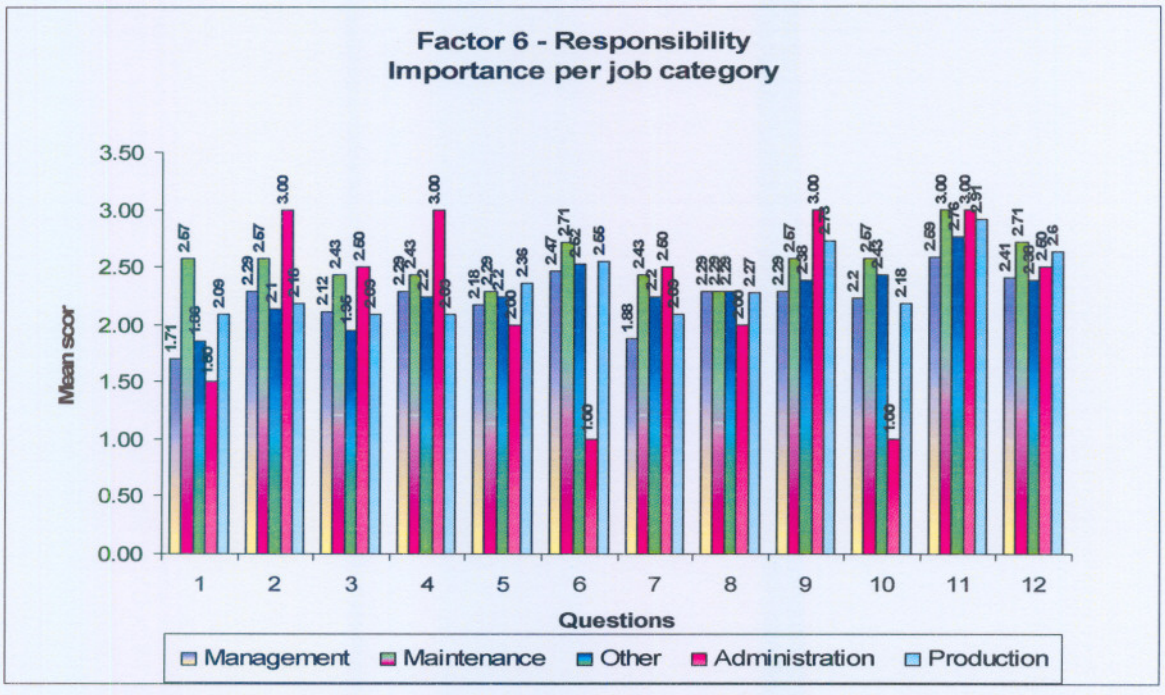


GRAPH A3.10: FACTOR 5- IMPORTANCE PER JOB CATEGORY

A3 (2).6 Responsibility

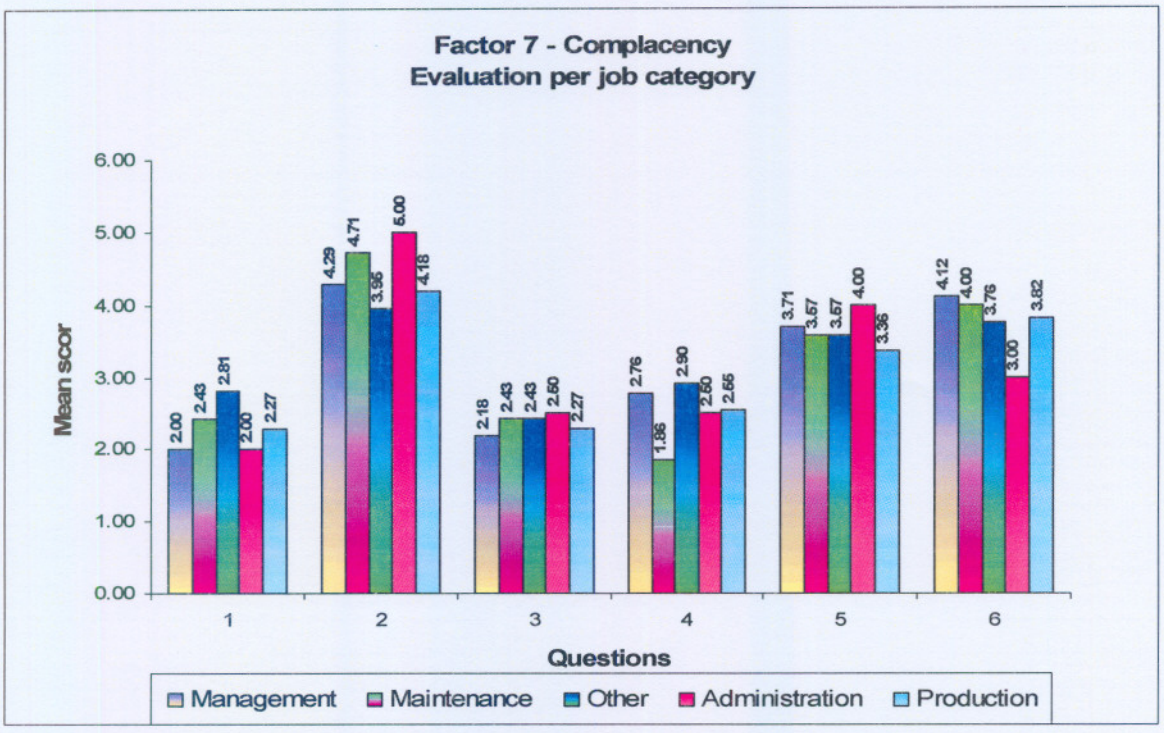


GRAPH A3.11: FACTOR 6- EVALUATION PER JOB CATEGORY

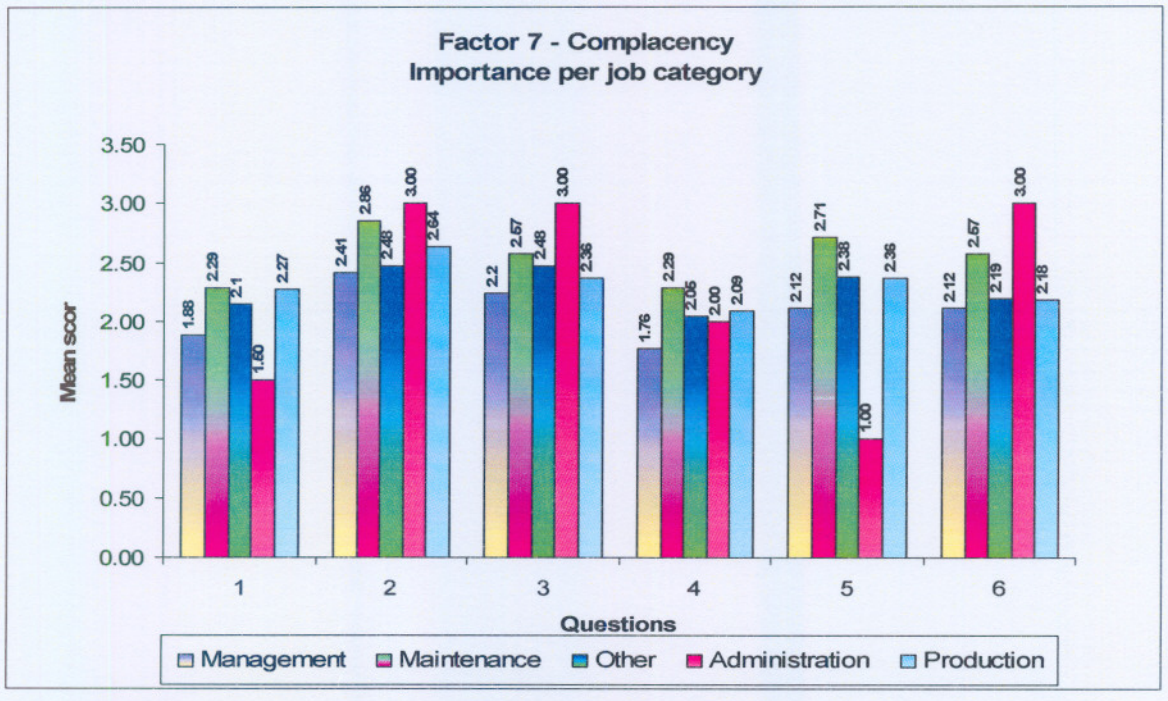


GRAPH A3.12: FACTOR 6- IMPORTANCE PER JOB CATEGORY

A3 (2).7 Complacency



GRAPH A3.13: FACTOR 7- EVALUATION PER JOB CATEGORY



GRAPH A3.14: FACTOR 7- IMPORTANCE PER JOB CATEGORY

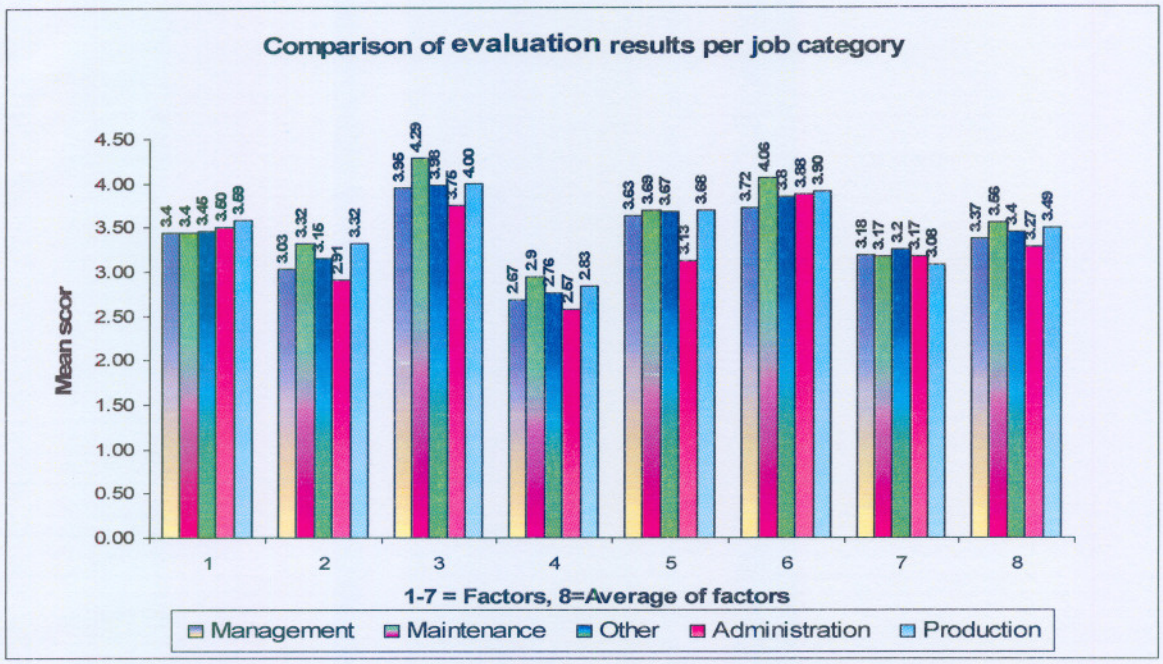
APPENDIX 4: SUMMARY OF THE FACTOR RESULTS

TABLE A4.1: EVALUATION RATING - MEAN AND STANDARD DEVIATIONS FOR JOB CATEGORIES

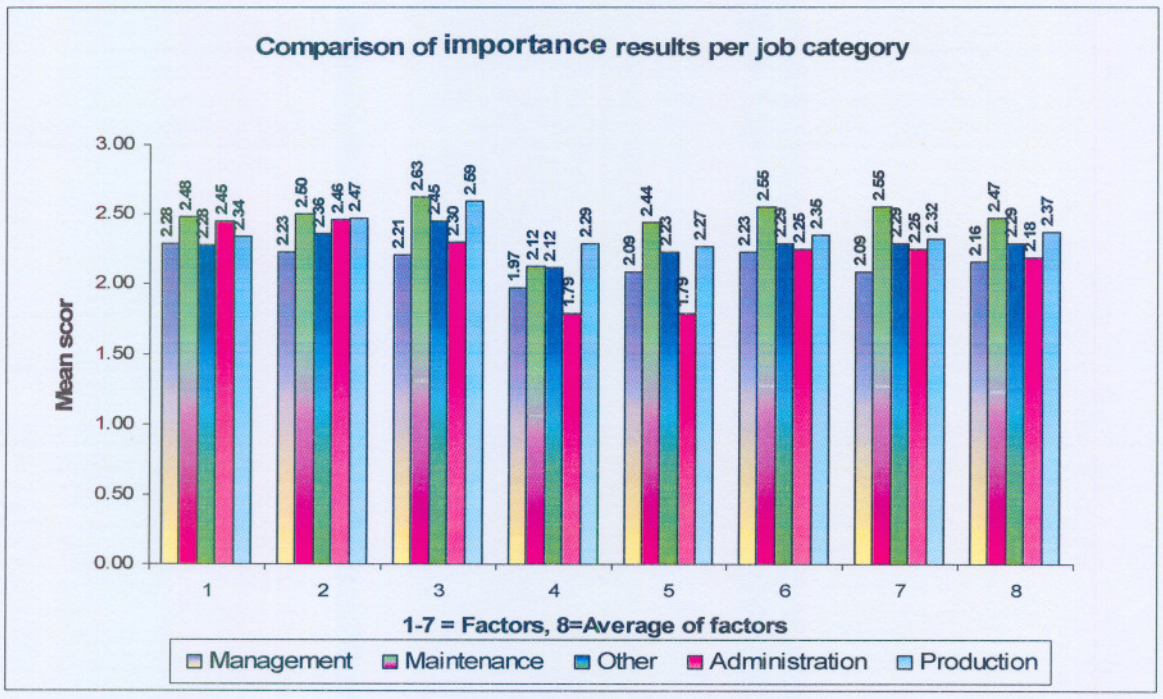
Factor	Management		Maintenance		Other		Admin		Production	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1. Management style and communication	3.44	0.98	3.44	0.89	3.45	1.01	3.50	1.22	3.59	0.96
2. Commitment, accountability and involvement	3.03	0.81	3.32	0.58	3.15	0.84	2.91	0.84	3.32	0.80
3. Risk awareness	3.95	0.89	4.29	0.52	3.98	0.76	3.75	0.92	4.00	0.70
4. Risk taking	2.67	1.19	2.94	0.92	2.76	0.92	2.57	1.21	2.83	1.11
5. Job satisfaction	3.63	0.88	3.69	0.81	3.67	0.82	3.13	1.83	3.68	1.07
6. Responsibility	3.72	0.96	4.06	0.49	3.84	0.72	3.88	0.88	3.90	0.93
7. Complacency	3.18	0.74	3.17	0.76	3.24	1.06	3.17	1.41	3.08	1.01
Maturity of culture (mean)	3.37	**0.92**	**3.56**	**0.71**	3.43	**0.88**	3.27	**1.19**	3.29	**0.94**
Maturity of culture (%)	67		71		69		65		66	

TABLE A4.2: IMPORTANCE RATING - MEAN AND STANDARD DEVIATIONS FOR JOB CATEGORIES

Factor	Management		Maintenance		Other		Admin		Production	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1. Management style and communication	2.28	0.73	2.48	0.54	2.28	0.71	2.45	0.51	2.34	0.55
2. Commitment, accountability and involvement	2.23	0.74	2.50	0.49	2.36	0.62	2.46	0.53	2.47	0.49
3. Risk awareness	2.21	0.76	2.63	0.49	2.45	0.61	2.30	0.42	2.59	0.49
4. Risk taking	1.97	0.80	2.12	0.67	2.12	0.75	1.79	0.30	2.29	0.65
5. Job satisfaction	2.09	0.76	2.44	0.55	2.23	0.69	1.79	0.88	2.27	0.56
6. Responsibility	2.23	0.76	2.55	0.47	2.29	0.71	2.25	0.47	2.35	0.52
7. Complacency	2.09	0.78	2.55	0.49	2.29	0.67	2.25	0.12	2.32	0.48



GRAPH A4.1: COMPARISON OF EVALUATION RESULTS PER JOB CATEGORY



GRAPH A4.2: COMPARISON OF IMPORTANCE RESULTS PER JOB CATEGORY