AN EXAMINATION OF THE OPERATIONAL APPLICATION AND UTILISATION OF POLYGRAPH TESTING: A CASE STUDY IN THE LIMPOPO PROVINCE

by

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TABLE OF CONTENTS

MAPS

DIAGRAMS

TABLES

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I extend my thanks to my wife and two children who supported me throughout the process, and to my clients in the Limpopo Province who assisted me whenever I called upon them to provide the additional information required to bring this research to its logical conclusion.

I extend my appreciation to my fellow polygraphists in the polygraph fraternity and to the friends who shared their experience and knowledge of the historical development of polygraphy in South Africa.

LIST OF ABBREVIATIONS

Abbreviation	Description
AFMGQT	Air force modified general question technique
AIIP	American International Institute of Polygraph (USA)
APA	American Polygraph Association
APD	Axciton Pharmaceutical Directory
ASIT	Academy for Scientific Investigative Training (USA)
BZT	Bi-zone test
CCMA	Commission for Conciliation, Mediation & Arbitration
CIA	Central Intelligence Agency (USA)
DI	Deception indicated
DIA	Defence Intelligence Agency (USA)
DoDPI	The Department of Defense Polygraph Institute (USA)
FBI	Federal Bureau of Investigation (USA)
GQT	General question technique
INC	Inconclusive
MGQT	Modified general question technique
NCCA	National Center for Credibility Assessment (USA)
NDI	No deception indicated
NO	No opinion
PASA	Polygraph Association of South Africa
PDD	Psycho-physiological detection of deception
PSIRA	Private Security Industry Regulatory Authority (South Africa)
SAIS	South African Institute of Security
SAPFED	Southern African Polygraph Federation
SAPPA	South African Professional Polygraph Association
ZCT	Zone Comparison Test

EXECUTIVE SUMMARY

This research study provides a historical orientation of the development of polygraphy in the United States of America and then focuses on the development of the local South African polygraph industry and its utilisation by the private sector and various government institutions. The historical orientation and contextualisation of polygraphy is based on information accessed through the electronic medium, acknowledged polygraph publications and first-hand information collected from individuals in the local polygraph fraternity.

The phases of the polygraph testing process, types of polygraph examinations and the various testing formats are defined, as well as the role of polygraphy to screen personnel and investigate crime. Aspects such as the polygraph training, the local polygraph associations and the legal status of polygraphy in terms of South African law are examined. The study explores the South African polygraph fraternity in general, but focussed in detail on the activities of polygraphists and polygraph companies operating in the Limpopo Province, South Africa.

The utilisation and development of polygraphy in the Limpopo Province, as well as various operational issues are explored as a case study. The role of polygraph testing to screen staff and to prevent crime in the workplace, as well as its role as an invaluable tool to investigate crime and resolve disputes by clients in the Limpopo Province, are examined. One thousand polygraph examinations were analysed for this purpose, to gain a unique and novel insight into the circumstances, challenges and operational obstacles faced by polygraphists in the Limpopo Province. While this analysis did not provide groundbreaking scientific findings, it did provide new insight into the types of crimes committed, the industries targeted by criminals, the profile of examinees tested, and the nature and scope of the polygraph-testing requirements in the province. The potential for expanding the polygraph industry in the Limpopo Province is also considered.

In conclusion, recommendations are made for the statutory regulation of the polygraph industry in South Africa, to ensure that ethical, operational and training standards are upheld. The importance of consolidating the local polygraph fraternity under one umbrella, in order to challenge and dispel uninformed opinions and myths concerning the use of polygraph testing, is also stresses. A proposal is also made concerning the indigenisation of current polygraph practises and polygraph training, to meet the unique conditions of Southern African.

Chapter 1

INTRODUCTION: MOTIVATION AND PROBLEM STATEMENT

1.1 MOTIVATION FOR RESEARCH

No comprehensive examination of the origin and development of polygraphy in South Africa has ever been conducted locally or abroad, nor has any research been undertaken to explore the operational application and utilisation of polygraphy in South Africa or the Limpopo Province in particular (Polygraph Services South Africa 2010: 1).

It is the intention of the researcher to be the first South African polygraphist to document the origin and development of polygraphy in South Africa and to carry out research on the practical conditions in which polygraph testing is conducted in the Limpopo Province.

This research is based on the assumption that a more-professional and more-efficient polygraph testing service can be provided to existing or prospective clients in the Limpopo Province if the operational circumstances in that province are clearly outlined and understood. This can only be achieved once the polygraph testing trends, the operational application and the practical utilisation of polygraph testing in that province have been examined, analysed and documented as a reference for other polygraphists contemplating polygraph testing in the Limpopo Province in the future.

The researcher believes that sufficient polygraph testing opportunities do exist and can be cultivated, given the large geographical area that the Limpopo Province covers and the large diversity of economic sectors and industries present in the region.

1.2 PROBLEM STATEMENT

The development of the polygraph industry in South Africa and the significant role that it plays as an important crime prevention and crime-fighting tool, has not previously been researched.

The extent to which polygraph testing is utilised in the Limpopo Province by the various economic sectors, private businesses and industries represented there, to prevent crime in the workplace, to investigate acts of crime and to resolve issues in dispute, has not previously been researched.

1.3 AIM OF THE RESEARCH

The aim of this research was to explore and document the origin and historical development of polygraphy in South Africa and to undertake a case study of the polygraph industry in the Limpopo Province.

In particular, the research aimed to determine the extent to which polygraphy was being used in that region as a crime-prevention measure to screen personnel and as an investigation tool to investigate criminal events and issues in dispute.

Furthermore, the research aimed to determine to what extent polygraph testing had served as a management tool to assist clients, to prevent crime in the workplace or as a forensic tool to investigate crime and resolve issues in dispute.

1.4 KEY THEORETICAL CONCEPTS

For the purposes of definitional and conceptual clarity only the foundational terms are inserted here. For additional concepts and specifically the more technical terms used in the practice of polygraphy see Annexure H for a more comprehensive list.

Deception indicated (DI): One of four possible outcomes reached at the conclusion of a polygraph examination, indicating that the examinee displayed significant responses deceptive (untruthful) responses to the relevant questions asked during the examination, and therefore failed the polygraph examination (Krapohl & Sturm 1997: 21).

Examinee: In polygraphy terms, an examinee is the person who is voluntarily undergoing or has undergone a polygraph examination (Jennings & Slupski 1997: 1(2)7).

Inconclusive (INC): One of four possible outcomes reached at the conclusion of a polygraph examination, indicating that the polygraphist was unable to reach a conclusive finding on the examinee's degree of deception or truthfulness. This occurs most often when the psycho-physiological responses recorded were not significant enough to make a finding (Krapohl & Sturm 1997: 36).

Lie-detection: The traditional generic term used when referring to the detection of deception and the verification of truth with the aid of some form of measuring instrument, testing

technique and examination questions pertaining to an issue under investigation (Jennings & Slupski 1997: 1(1)10).

Lie-detector: The traditional generic term used when referring to the polygraph instrument, that is utilised for the detection of deception and the verification of truth (Jennings & Slupski 1997: 1(2)10; Krapohl & Sturm 1997: 40).

No deception indicated (NDI): One of four possible polygraph examination outcomes reached at the conclusion of a polygraph examination, indicating that the examinee displayed 'not deceptive' (untruthful) responses to the relevant questions asked during the examination and therefore passed the polygraph examination (Krapohl & Sturm 1997: 45).

No opinion (NO): One of four possible polygraph examination outcomes reached at the conclusion of a polygraph examination, indicating that the polygraphist was unable to reach a conclusion or finding. This most often occurs when the examination was stopped prematurely, interrupted or when insufficient or unsuitable charts were collected for evaluation (Krapohl & Sturm 1997: 46).

Periodic screening: Polygraph examinations conducted at set intervals to verify that employees (examinees) are maintaining the level of honesty and integrity required of them by their employer or the position they occupy (Jennings & Slupski 1997: 8(1)7).

Polygraphy: The traditional term used to refer to the practise of polygraph testing by a polygraphist using a polygraph instrument and recognised polygraph examination procedures, for the purpose of detecting deception and verifying truth in a matter under investigation (Jennings & Slupski 1997: 1(2)16; Krapohl & Sturm 1997: 50).

Polygraph examination: The term 'polygraph examination' is the common collective term for the entire polygraph testing process when at least three polygraph charts are collected during three successive examinations and evaluated (Jennings & Slupski 1997: 1(2)15).

Pre-employment screening: Polygraph examinations conducted as part of a screening process prior to the recruitment of prospective employees, to determine their level of honesty

and integrity and to verify their suitability for the position under consideration (Jennings & Slupski 1997: 8(1)1-3).

Specific-issue polygraph examinations: Polygraph examinations conducted to investigate a specific issue in dispute, such as a crime, an allegation of sexual harassment or to verify a version of events for example, involving the examinee in question (Jennings & Slupski 1997: 1(2)19).

1.5 VALUE OF THE RESEARCH

This dissertation is unique in South Africa. No comprehensive research has previously been published on the operational application and utilisation of polygraph testing in South Africa, nor is the history of polygraphy in South Africa comprehensively documented in any publication. The historical developments and utilisation of polygraphy in the private sector have received sporadic media coverage over the years but the significant developments in the industry over the past thirty-three years are not widely known. The historical development of polygraphy in the local military, intelligence and law enforcement establishments has until now not been documented for public perusal in a research study.

This research will provide the reader with a basic background of the origin of the field of polygraphy in general, followed by a detailed history of the origin and early pioneers of polygraphy in South Africa. The activities and workings of the current private polygraphy industry in South Africa will also be examined.

In terms of the research dealing specifically with circumstances in the Limpopo Province, the research will give the reader a better understanding of the unique operational circumstances and working conditions that prevail in the province and that any polygraphist operating in that region can expect to encounter. The research will also provide any polygraphist contemplating working in the province with a useful guide in terms of the economic and operational obstacles they can expect, especially in some of the rural environments and testing settings.

The research will identify the vulnerable industries and specific products that are most often targeted by criminals active in the province and assist any business or risk manager to take appropriate security measures and put effective operational procedures in place to reduce

their risk profile and vulnerability to crime in their specific industry. Polygraphists consulting the research would be better informed in terms of the potential to expand or refine their business and services and to meet the demands of existing and potentially new clients in the province. This will ensure that they have realistic expectations in terms of what the Limpopo province and various industries operating there can offer.

From an operational perspective, new polygraphists operating in the region will be able to benefit from the experience of polygraphists who have operated in the region before, in terms of lessons learnt, adaptations made to operational procedures, test format preferences or scoring options used.

The research will also provide useful information to vulnerable businesses and companies or industries that do not currently utilise polygraphy on the scope and nature of crime in the work-place as well as a profile of the typical criminal targeting businesses in Limpopo Province. This useful information will contribute to a better understanding of the role that polygraphy can play in assisting these vulnerable businesses in their efforts to reduce crime and limit their vulnerability and exposure to criminals targeting the province.

1.6 CHAPTER OUTLINE

This research report (dissertation) was divided into a number of chapters:

Chapter 1: introduces the dissertation and covers the motivation, problem statement and aim of the research. The key theoretical concepts (foundational) used in the dissertation are introduced (with the more technical terminology listed in an annexure for further information). This chapter also briefly discusses the value of the research.

Chapter 2: discusses the research approach adopted and the methodology used to select and codify the primary research information, and discusses the techniques used to the research the data collected and to conduct follow-up research. Other aspects including the data analysis, ethical considerations, the integrity and quality of the research, confidentiality and obtaining of approval where appropriate are covered in this chapter.

Chapter 3: provides an historical perspective of the origin and development of polygraph testing in South Africa and the Limpopo Province. The polygraph companies that had

previously operated in the province and those that still operate there now, are identified and their scope of activity examined.

Chapter 4: provides an operational analysis and statistical comparison of the data extracted from the one-thousand polygraph examinations selected for the case study from the researcher's existing database containing over 2 500 polygraph examinations.

Chapter 5: discusses the various issues that have emanated from the research, including the implications and prospects of polygraph testing to prevent crime in the workplace and its role as an investigation tool. The polygraphist's daily activities and operational obstacles are also discussed, including the issue of counter-measures used by examinees, the difficulties experienced with some industries and at some polygraph testing venues, and the potential for expanding the polygraph testing industry in the Limpopo Province and further afield.

Chapter 6: makes recommendations concerning the statutory regulation of the polygraph industry in South Africa. The importance of ensuring that ethical, operational and training standards, are complied with and upheld by all polygraphists operating in South Africa is also discussed. The importance of consolidating the local polygraph fraternity under one regulatory umbrella, in order to challenge and dispel uninformed opinions and myths concerning the use of polygraph testing, is also addressed. Finally, proposals are made regarding the indigenisation of current polygraph practises and training, to meet the unique conditions of Southern Africa.

1.7 CONCLUSION

It is hoped that this dissertation will contribute valuable information to the existing body of knowledge on polygraphy by documenting its historical development in South Africa, and by providing a better understanding of the operational circumstances and practical utilisation of polygraphy, particularly in the sphere of crime prevention and detection in the Limpopo Province.

Chapter 2

RESEARCH METHODOLOGY

2.1 INTRODUCTION

This chapter deals with the research approach and methodology used to conduct this research. The literature review undertaken will be discussed, followed by a description of the research approach adopted. The criteria used to select the sample group, the method employed to collect the primary data and the procedures followed to codify the primary research data are considered. The steps taken to conduct follow-up research on the history of polygraphy and collect additional information from specific clients are then described. Other aspects and issues discussed and dealt with in this chapter include the analysis of the collected data; research ethics considered; the integrity and quality of the research; confidentiality, anonymity and privacy issues; and obtaining of consent approval where appropriate.

2.2 RESEARCH APPROACH

2.2.1 Literature review

Firstly, a comprehensive literature review was undertaken in order to:

- orientate the researcher with the field of study, both locally and abroad;
- identify all comparable polygraph research done locally and abroad;
- identify any primary research conducted specifically on the topic in South Africa and in particular the Limpopo Province; and
- to determine if any research had been done locally or abroad specifically on the operational application and utilisation of polygraphy (Mouton 2001: 86-91).

Archive material collected by the researcher over the past 34 years, dating back to 1977, was also reviewed to extract all relevant and useful information pertaining to the topic.

Local and international legislation dealing with the use of polygraphy was perused and relevant issues pertaining to this dissertation were extracted from this legislation. In this regard, the issue of statutory regulation of, and restrictions on the use of polygraphy received special attention.

2.2.2 Research approach

A mixed methods approach was utilised to conduct the research because of the diversity of the primary sources and data concerned. Creswell (2006: 6) states that a mixed method approach involves collecting and analysing both quantitative and qualitative data to achieve the researcher's objectives. Firstly, a quantitative approach was used in order to collect the primary data. Mistry, Minnaar, Patel and Rustin (2003: 51) state that a qualitative approach includes small samples and a detailed examination of the experiences of the participants. Thereafter a qualitative approach was used to collect additional data by using an unstructured questionnaire with open-ended questions. According to Mistry et al (2003: 51), a qualitative approach includes large samples and utilises numbers to measure variables and statistical analysis to make sense of the data.

In order to collect the primary data contained in the 1 000 polygraph examinations selected for this research a quantitative approach was selected. The data was originally collected in a structured polygraph examination interview setting by the researcher, in his capacity as a polygraphist conducting polygraph examinations. The researcher did therefore not need to collect additional data from the primary sources to complete the initial research because it was already available in document form on each 'polygraph examination interview questionnaire' (see Annexure A) and merely needed to be collated, codified, analysed and presented in a suitable manner.

A qualitative approach was also used to collect the additional primary data required from specific critical groups, namely three prominent clients (see par 5.3 and Tables 20-22 below) to complete the unstructured 'post-examination client information questionnaire' (see Annexure C). Mistry et al (2003: 103) describe critical case sampling as the collection of data that could highlights exceptional case and provide further insight and into a topic.

The terms 'client or clients' used in this research refer to companies, businesses and individuals who instructed/commissioned the researcher or other polygraphists in the Limpopo Province to conduct polygraph examinations on their behalf.

A similar approach was adopted to collect additional primary data pertaining to the history of polygraphy in the Limpopo Province (see Annexure D) and South Africa (see Annexure E).

2.3 METHODOLOGY

2.3.1 Sample group

According to Mistry et al (2003: 77), a sample is a group that is chosen for further study and usually represents a portion of a larger population. The sample group (primary research material) selected for this study represented a large segment of the researcher's business archives (target population) of over two-thousand five-hundred polygraph examinations that had been conducted by the researcher in his capacity as a polygraphist since 1998. The sample group was therefore already available in a structured and orderly written format awaiting selection and further analysis.

A systematic approach was adopted to select the primary sample group for this research. The researcher believed that a sample group of 1 000 polygraph examinations, representing a period of almost four years of polygraph testing (24 April 2006 to 22 February 2010) would provide a credible and representative sample group.

2.3.2 Selection of primary research material

The 1 000 polygraph examinations selected for this research were required to satisfy two important criteria, namely that they had been conducted by the researcher within the geographical boundaries of the Limpopo Province and that they had provided a clear and unambiguous result/finding.

2.3.3 Sampling

A maximum variation sampling approach was adopted by the researcher. Mistry et al (2003: 103) defines maximum variation sampling as an approach used to collect the broadest range of information and perspectives on a subject. In order to achieve this goal, the researcher selected a sample of 1 000 completed polygraph examinations. The polygraph examinations selected had already been captured in a structured written format on a two-page 'polygraph examination interview questionnaire' on the day that the polygraph examination in question had originally been conducted by the researcher on behalf of a commissioning business/client.

2.3.4 Codifying research data

In order to record, collate and analyse the primary data collected a columned electronic 'data table' (see Annexure B) was designed using both nominal and ordinal measurement values and a number of obvious data categories and sub-categories to reflect the codified data.

The researcher then systematically allocated codes to the various categories of data and proceeded to insert the codified data into the electronic data table.

The data table comprised of twenty-two columns:

Columns 1-18 reflected codified data extracted from each examinee's 'polygraph examination interview questionnaire'. This data described the personal profile of each of the 1 000 examinee's polygraph tested as well as the operational data pertaining to each polygraph examination concerned:

Column 1: Reflecting the reference number of each examinee
Column 2: The economic sector or business industry that the client operated in represented (a)
Column 3: The geographical are where the client operated from or where the events occurred (b)
Column 4: The racial group of the examinee (c)
Column 5: The gender of the examinee (d)
Column 6: The age category of the examinee (e)
Column 7: The number of polygraph examinations that the examinee had previously undergone (f)
Column 8: The marital status of the examinee (g)
Column 9: The number of children under the examinee's direct supervision (h)
Column 10: The examinee's highest school qualification or academic qualification (i)
Column 11: The examinee's occupation, profession, vocation or main economic activity (j)
Column 12: Any criminal record or prior exposure to the criminal justice system (k)
Column 13: The language used to conduct the polygraph examination on the examinee (l)
Column 14: The general purpose or focus of the polygraph examination (m)
Column 15: The specific purpose of the polygraph examination (m)
Column 16: The monetary loss incurred by the client (o)

Column 17: The polygraph examination format used to conduct the polygraph examination (p)

Column 18: The polygraph examination result or finding reached by the polygraphist (q)

The remaining four columns (19-22) were later used to record the coded data collected from some specific clients using the 'post-examination client confirmation questionnaire' (see Annexure C) as described in par 2.3.5 below:

Column 19: The eventual outcome or actions taken by the client after receiving the polygraph examination results/finding from the polygraphist (r)

Column 20: The various disciplinary options available to the client and taken against examinees where appropriate (s)

Column 21: The cases that proceeded to the Commission for Conciliation, Mediation and Arbitration (CCMA) and the various outcomes (t)

Column 22: The cases that resulted in the client instituting criminal proceedings against the examinee and the various outcomes (u)

The Microsoft Office Access 2003 computer programme was used to create the data table represented.

2.3.5 Follow-up research and collection of additional data

In order to bring the primary data into perspective and to bring each polygraph examination used in this research to its logical conclusion, it was essential to collect and generate additional post-examination client data directly from each business/ client who had made use of the researcher when he conducted the 1 000 polygraph examinations used for this research.

An estimated eighty percent of this data was already available or known to the researcher, due to his ongoing interaction with regular clients and the ongoing feedback that he had received obtained around the time that the original polygraph examinations were conducted. In the remaining approximately twenty percent of the cases, this data was not available and would have to be collected directly from the clients concerned. All the data already available or known to the researcher concerning the post-examination outcomes or actions taken by these clients, was codified and then inserted into the four appropriate columns in the data table (see Annexure B, columns 19-22).

A list was compiled of the polygraph examinations where the post-examination outcomes or actions taken by the client were not available or not known. The relevant business archives were then scrutinised and the contact details of these clients collected so that the outstanding data could be collected. The post-examination client confirmation questionnaire (see Annexure C) was constructed for this purpose. The researcher used a qualitative approach and the unstructured questionnaire during telephonic interviews with clients/representatives of the businesses concerned to document all relevant data relevant to this study.

The clients concerned were asked what actions they had taken after being provided with a polygraph finding at the conclusion of polygraph examinations where an examinee had 'failed' the polygraph examination and had been linked with a crime or event under investigation by the client. In the case of pre-employment polygraph examinations, the results were in most cases clearer. Clients rarely employed examinees who had struggled to 'pass' their polygraph examination, and had therefore not been recommended for employment by the polygraphist. The options recorded are reflected in the relevant columns of the data table.

2.3.6 Collection of historical data

In addition to the primary research material selected, data concerning the historical development of polygraph testing in South Africa needed to be collected. For this purpose, a number of individuals who were known by the researcher to have unique insight into the historical developments of polygraphy in South Africa were identified. Six active polygraphists who had operated or were still operating in the Limpopo Province, were also identified to provide insight into their activities in the region. The researcher telephonically interviewed these individuals, using a qualitative approach and unstructured questionnaires (see Annexure D&E) to document all relevant data pertaining to this study.

These individuals were able to provide unique insights into, and perspectives on early developments in the private sector and public sector. This included background information on the establishment of the Polygraph Association of South Africa (PASA) and the South African Professional Polygraph Association (SAPPA), the establishment of polygraph sections in the former Military Intelligence Division (MID) and National Intelligence Service (NIS). Information concerning the development and utilisation of polygraphy in the newly established National Intelligence Agency (NIA), South African Secret Service (SASS) and the South African Police Service (SAPS) would also be obtained.

2.3.7 Data analysis

For the purpose of the data analysis, the examinees who had undergone the 1 000 polygraph examinations selected, represented the unit of analysis while the polygraph examinations themselves represented the data sources. According to Mistry et al (2003: 97), the objects of the research or an investigation are defined as units of analysis.

As soon as the coded data was inserted into the data table, the researcher proceeded to analyse the data in the various categories, using the Microsoft Office Access 2003 computer programme as aid. He focussed on the following in the various data categories and sub-categories reflected in the data table:

- to identify frequencies with which events or things occurred;
- to categorise certain events and things to reflect relevance;
- to order, rate and rank events and things to reflect importance; and
- to measure certain elements to reflect importance.

The researcher sought to make comparisons in order to identify specific statistical trends and to generate tables that would reflect and display these trends. The researcher also sought to identify operational and criminological trends that could be used later to advise his clients on how to prevent and investigate crime in the workplace. At the conclusion of this process, diagrams 1-2 and tables 1-22 were compiled, to reflect the researcher's understanding of the data analysed.

2.4 ETHICAL CONSIDERATIONS

2.4.1 Integrity and quality of research

The primary data used for the case study on the operational application and utilisation of polygraph testing in the Limpopo province, was obtained from polygraph examinations that were conducted within the parameters of the 'standards of practice' and the 'code of ethics' laid down by the American Polygraph Association (APA) in its constitutional bylaws (see Annexure F).

Any polygraphist in South Africa is required to vouch for the validity, accuracy and objectivity of each polygraph examination that had been conducted, and to defend the

outcome or findings in any disciplinary hearing, Commission for Conciliation, Mediation and Arbitration (CCMA) case or legal proceedings he/she may be required to attend. This level of professionalism suggests that a high degree of integrity and ethics was applied when the original polygraph examinations used for this research were conducted in the field.

All the information collected from the sources listed in the bibliography and from the research material consulted during the comparative study phase was properly ascribed to the relevant original source.

2.4.2 Confidentiality, anonymity and privacy

According to Mouton (2001: 243-4) informants sometimes choose to remain anonymous and the researchers must treat the information which they provide as confidential. A number of the individuals consulted or referred to in the historical account of the development of polygraphy in South Africa are former members of the former-NIS intelligence structures. In some cases, their identities were not revealed in this research study, in order to protect their privacy and guarantee their anonymity. In addition, no information that could jeopardise the national security of South Africa, any law enforcement staff or any intelligence structure was included.

The polygraph profession in general and the APA Bylaws require that all information collected during a polygraph examination concerning the client, examinee or any other related matter should always be handled confidentially, to protect the anonymity, dignity, privacy and basic human rights of all concerned.

All the clients interviewed while collecting the data required to complete the ‘eventual conclusion/post-examination client confirmation questionnaire’ were informed at the outset what the purpose of the interview was and that the information used in this research study would not identify the examinee or reveal any compromising or embarrassing information.

2.4.3 Obtaining consent and approval

The nature of this research study and the issues addressed did not require that the researcher obtain any specific consent or approval.

2.5 CONCLUSION

The research approach and methodology employed in this research study, in order to select the sample group and codify the primary research information was discussed in this chapter. This was followed by a discussion of the techniques used to research the data collected and to conduct the follow-up research to collect the additional data required. A number of other aspects were also dealt with, including the analysis of the data, ethical considerations, the integrity and the quality of the research conducted, confidentiality, anonymity and privacy issues and finally the issue of obtaining consent and approval where appropriate.

Chapter 3
BACKGROUND CONTEXTUALISATION OF POLYGRAPHY

3.1 INTRODUCTION

The use and development of lie-detection and truth verification procedures by criminologists investigating crime and criminal behaviour can be traced back over one hundred years. Today over 48 countries around the world, including South Africa, utilise polygraphy as an investigative tool and to verify the honesty and integrity of job applicants (APA 2009: 337-353).

In this chapter, we trace the development and utilisation of polygraphy around the world since the late 19th century and explore its introduction into South Africa in the early 1970's. We follow the subsequent growth of polygraphy in the private sector and public sector and examine the nature and scope of the broader polygraph industry in the country today.

3.2 OPERATIONAL ORIENTATION TO POLYGRAPHY

3.2.1 What is polygraphy?

Polygraphy or polygraph testing refers to a psycho-physiological examination carried out by a polygraphist, using a polygraph instrument and recognised polygraph examination procedures to detect deception and verify the truth in a matter under investigation (Krapohl & Sturm 1997: 50).

During a polygraph examination, specific psycho-physiological responses are collected from the body of the examinee and evaluated according to recognised and validated procedures. In this manner a finding is made concerning the examinee's truthfulness to the relevant questions asked (Jennings & Slupski 1997: 1(1)16).

While polygraph testing was initially developed as an investigation tool, it is now also widely used in the workplace as a personnel screening tool, to verify the honesty and integrity of new job recruits and of existing staff members (Louw 2004: 3-4).

3.2.2 The polygraph examination

A polygraph examination is usually requested by a business or an individual (the client), who requires assistance to investigate or resolve an issue in dispute or to verify the integrity of an individual prior to recruitment.

Prior to the commencement of the polygraph examination the polygraphist is provided with a detailed briefing by the client on the purpose and scope of the examination. The polygraphist can then acquaint himself with circumstances and issues in question and prepare his approach accordingly. Once a suitable venue for the examination has been identified and the polygraphist has set up his polygraph instrument, the polygraph examination commences (Jennings & Slupski 1997: 4(2)1-3).

3.2.2.1 The pre-test interview

The polygraphist first proceeds to conduct a very structured 'pre-test interview' with the examinee, using the 'polygraph examination interview questionnaire' (see Annexure A) in order to document all relevant information and to address the following aspects (Matte 2009: 327-330):

- the examinee's identity is verified and other relevant biographical information is collected and recorded on the questionnaire;
- a common language that will be used to communicate with the examinee for the duration of the polygraph examination is selected;
- the purpose and scope of the polygraph examination and the issues in dispute or under investigation are discussed and clarified with the examinee;
- the examinee's voluntary consent and agreement to undergo the polygraph examination on the issue(s) in question are obtained in writing;
- a determination of whether the examinee is physically and mentally suitable to undergo the polygraph examination is made, by asking him/her a number of general questions concerning their general state of health;
- the examinee's general background is discusses with him/her and a personal profile is formulated by the polygraphist. This information will assist the polygraphist to formulate appropriate control/comparison questions to be utilised in the polygraph examination;

- various psychological elements related to polygraph theory are discussed with the examinee and the psychological foundation for the polygraph-testing phase, 'the in-test' are laid;
- in the case of a pre-employment polygraph examination, the examinee's curriculum vitae and job application would normally be available to the polygraphist and is used to focus the interview appropriately and to prepare suitable relevant questions;
- in the case of an investigation or specific issue in dispute, the details of the dispute, the case facts and the examinee's version of, or role in the events, will be discussed and clarified. This information will later be used by the polygraphist to prepare suitable relevant questions, to address the issues in dispute;
- an appropriate recognised and validated polygraph examination question format will be selected at this point, suitable comparison and relevant test questions will be constructed and these will be inserted into the question format to address the entire purpose and scope of the polygraph examination (Jennings & Slupski 1997: 2(1)1-19);
- the test questions that will be put to the examinee during the polygraph examination, are then discussed and reviewed with the examinee. The 'in-test' polygraph procedures are explained and rehearsed with the examinee until they are familiar and comfortable with the language, sequence and procedures that will follow; and
- finally, the examinee is provided with a detailed explanation of how the polygraph instrument operates, how each polygraph instrument attachment will be placed on the examinee's body and what physiological aspects of the examinee's anatomy will be recorded during the examination. The examinee will also be provided with a general explanation of how the polygraphist will make a finding at the conclusion of the examination, based on the psycho-physiological recordings made during the 'in-test' phase of the polygraph examination (Jennings & Slupski 1997: 4(2)1-16; Matte 2009: 327-330).

This first (pre-test) phase of the polygraph examination is now complete. It is followed by the second phase of the examination, the 'in-test' phase.

3.2.2.2 The in-test phase

At this point, the polygraph instrument attachments are physically placed onto the examinee's body (Jennings & Slupski 1997: 4(3)1-16; Matte 2009: 330):

- a blood-pressure cuff is attached onto one of the examinee's arms to monitor cardiovascular changes;
- two convoluted pneumograph tubes are attached across the examinee's upper and lower chest to monitor respiratory changes; and
- two finger-plates are attached onto the ring and index fingers to monitor electro-dermal changes and sweat-gland activity in the skin of the examinee.

Some newer polygraph instrument models now offer additional attachments that can be utilised, namely:

- a plethysmograph clasp placed on the tip of an index finger or thumb of the examinee to monitor additional cardiovascular activity (Matte 2009: 184-5);
- a movement sensor placed under the chair of the examinee to monitor subtle body movements (Matte 2009: 58-9).

The examinee is then subjected to the test questions while his psycho-physiological responses are recorded onto the polygraph instrument as he answers each question with a 'Yes' or 'No' answer. The primary aim of this phase is to generate and record at least three suitable polygraph charts for later evaluation. When this is complete, this phase is concluded (Jennings & Slupski 1997: 3(1)1-12).

3.2.2.3 The post-test interview

The final phase of the polygraph examination, the 'post-test interview', commences with the polygraphist evaluating the three polygraph charts that have been recorded and making a determination as to whether the examinee was truthful or deceptive to the issues under investigation or not. This is done by the polygraphist manually hand scoring each relevant question using a recognised and validated procedure and scoring criteria (Jennings & Slupski 1997: 3(2)1-93; Matte 2009: 371-397).

The polygraphist will usually also consult one or more digital computerised scoring programme to generate an independent evaluation of the examinee's charts, in order to refine his findings (Jennings & Slupski 1997: 4(1)8-10).

The finding will then be discussed with the examinee and he/she will be allowed the opportunity to offer some feedback, to give any plausible explanations or to express an opinion about the findings or the outcome of the polygraph examination.

Finally, a comprehensive and conclusive finding of 'no deception indicated' (NDI), 'deception indicated' (DI), 'inconclusive' (INC) or 'no opinion' (NO) will be made, based on the polygraph examination findings and after all relevant facts and information available have been taken into consideration.

At this point, the polygraph examination is concluded in most cases, unless further polygraph testing is deemed necessary to clarify a matter emanating from the previous examination. The examinee leaves the polygraph testing venue and the polygraph examination is concluded.

The polygraphist usually discusses the polygraph examination findings with the client prior to leaving the client's premises. A formal written polygraph examination report is then prepared by the polygraphist and submitted to the client soon thereafter, for further utilisation (Jennings & Slupski 1997: 4(1)11-16).

3.2.3 Detailed information collected during a polygraph examination

Each polygraph examination comprises of extensive detailed information concerning the examinee, the issue under investigation, the client and the purpose and scope of the polygraph examination (Jennings & Slupski 1997: 1(3)10):

- briefing notes reflecting the case-facts and describing the issues in dispute, which are obtained from the client commissioning the polygraph examination during the briefing of the polygraphist;
- copies of all relevant documents, received from the client and relating to the issue under investigation or to the examinee, in the case of a screening examination;
- the 'Polygraph examination interview questionnaire' discussed in the previous section;
- the polygraph charts collected for evaluation during the 'in-test' phase are often printed but nowadays they are most often scored directly on the polygraph instrument screen and stored electronically on the polygraph instrument;
- a score sheet reflecting the numerical manual hand scoring of the charts and a finding;

- printouts or notes reflecting the independent results produced by the digital computerised scoring programmes consulted;
- notes reflecting any other relevant comments or observations made by the polygraphist; and
- a typed report compiled after the polygraph examination has been completed, and submitted to the client. This report will include the specific details pertaining to the purpose and scope of the polygraph examination, details identifying the examinee tested, the examination test format utilised and the relevant questions asked, and the findings reached by the polygraphist (Jennings & Slupski 1997: 4(5)1-3).

Polygraph companies are generally required to keep all documents and records pertaining to all polygraph examinations that have been conducted for a reasonable period of time, in case any legal dispute or challenges should arise later on. No legislation enforces this in South Africa but any polygraphist who is a member of the PASA is required to retain these records for a period of at least five years (PASA 2010a: 8) while APA members must retain these records for at least one year (see Annexure F, par 4.7.2).

The historical polygraph testing records of any examinee who has previously been tested prove very useful when he/she is required to undergo further regular or periodic screening polygraph examinations or comes under suspicion again at a later date or in similar suspicious circumstances.

Financial records and receipt books must be retained between five and seven years in terms of local fiscal and South African Revenue Service legislation.

3.2.4 Types of polygraph examinations

Two types of polygraph examinations are most commonly utilised during polygraph testing:

- personnel screening-type polygraph examinations;
  - pre-employment screening polygraph examinations intended to verify the honesty and integrity of job applicants and to evaluate their suitability for a particular position or job; and

- periodic screening and random screening polygraph examinations intended to verify that employees are maintaining the level of honesty and integrity required of them in a particular position or job (Jennings & Slupski 1997: 1(1)19).

- investigation-type or specific-issue polygraph examinations;
  - these include polygraph examinations conducted to investigate specific events, such as a theft in the workplace, an issue in dispute, an allegation of sexual harassment or to verify a version of events involving the examinee in question.

  - the polygraph examination is intended to collect new or additional information that will assist an investigation or generate evidence that corroborates other evidence already known (Jennings & Slupski 1997: 1(1)19).

3.3 THE ORIGIN AND DEVELOPMENT OF POLYGRAPHY

The United States of America is undoubtedly the modern home of polygraphy. The entire international polygraph profession and international polygraph instrument manufacturing industry are dominated by the significant scientific research and operational polygraphy developments in that country (Matte 1996: 6).

A number of early European researchers did however contribute significantly to the formulation of a number of theories that still underpin modern polygraphy today.

3.3.1 Early developments in polygraphy

The origins of modern polygraphy and the psychophysiological detection of deception can be traced back to a number of important historic events and scientific developments in the fields of criminology, sociology, physiology and psychology. Developments in these related fields during the late nineteenth century and early twentieth century in particular played an important role in the development and understanding of this discipline (Matte 1996: 10-11).

In the late 19th century, the Italian physiologist Angelo Mosso (1846-1910) and Italian criminologist Cesaré Lombroso (1836-1909) experimented extensively with equipment and procedures designed specifically to detect and record psycho-physiological changes in the human body that are associated with fear and stress. Both designed simple instruments that were able to record cardiovascular changes associated with deception. German physiology

researcher Georg Sticker (1860-1960), identified physiological changes in the skin (galvanic skin response) that could be used to detect deception in humans (Nelson 2009a: 47).

Mosso, Sticker and Lombroso's research laid an important foundation for various modern polygraph theories and were able to demonstrate a direct correlation between physiological responses in the human body and changes in the levels of stress and deception

In the early part of the 20th century, Italian psychologist, Vittoria Benussi (1878-1927) emphasised the role of respiration (breathing) changes in the detection of deception and contributed to the various theories concerning the psycho-physiological changes emanating from human respiration. According to Dr James Matte (Matte 1996: 17), Benussi appears to have been the first researcher to record two physiological responses in the body (the heart/cardiovascular system and breathing/respiratory system) simultaneously for evaluation purposes.

During the early 1920's, German-born Harvard University psychiatrist, Dr Hugo Munsterberg (1863-1916) and his protégé, American lawyer Dr William Marston (1893-1947) published extensive research on the role of blood pressure and changes in heart rates in the detection of deception. Munsterberg also developed the widely used 'Relevant-Irrelevant' (R&I) testing technique, contributed significantly to the refinement of test question procedures and emphasised the importance of word association in deception (Nelson 2009: 53). Munsterberg and Marston's research prompted a young Canadian psychologist-turned-Californian police officer Dr. John Larson (1892-1965) to develop very useful polygraph applications and procedures for use by law enforcement agencies in California. Larson is also credited with designing and developed the first modern polygraph instrument that simultaneously recorded and measured heart rate (pulse), blood pressure and respiration changes. He named his instrument 'the polygraph' (Nelson 2009a: 47; Galianos 2006: 1).

In the ensuing years, American psychologist and colleague of Larson, Leonarde Keeler (1903-1949) also made significant contributions to polygraphy and refined Larson's polygraph instrument. Keeler is today regarded as the father of modern polygraphy. He developed the 'peak of tension' (POT) and 'searching peak of tension' (SPOT) testing techniques and in 1939 a polygraph instrument, the 'Keeler polygraph', designed and

developed by him, was patented and became commercially available in the USA (Nelson 2009: 53; Galianos 2006: 1).

In 1947, American lawyer John. E. Reid (1910-1982) developed the 'control question technique' (CQT), which is today still the most widely used polygraph testing technique. Reid also made very significant contributions towards the development of polygraph question formulation principles, the identification of countermeasures and the design of various polygraph test question techniques (Nelson 2009: 53; Galianos 2006: 1).

In 1948, Keeler founded the world's first polygraph school, the Keeler Polygraph Institute, in Chicago, Illinois (Galianos 2006: 1).

As with many other scientific developments and research breakthroughs, military conflicts, international political tension and an increase in crime around the world have played a significant role in the development and refinement of polygraphy. Increased Cold-War espionage and East-West conflict after the Second World War in particular propelled polygraphy into the limelight and modern-age. Polygraph testing became an important tool in the counter-intelligence and counter-espionage arsenal. During the latter part of the twentieth century, many academics in the fields of criminology, physiology, psychology and law enforcement in the United States intelligence community and the polygraph fraternity in particular, have contributed significantly to the body of literature and knowledge upon which modern polygraphy is founded today. American polygraphists, Dr William Yankee, Dr Stanley Abrams, Richard Arther and Dr James Matte deserve special mention in this regard because they continue to make important scientific contributions to the profession and to conduct useful research in many fields associated with polygraphy. These visionaries have ensured that the polygraph profession remains at the forefront of the fight against crime, espionage, terrorism and organised crime in the 21st century (Matte 1996: 39-62).

Cleve Backster, who instituted the United States Central Intelligence Agency's (CIA) first polygraph program in 1948, is credited with refining the 'control question technique' (CQT) and developing the 'zone comparison test' (ZCT). The ZCT is widely regarded as the most accurate single-issue testing format. He contributed significantly to the development of appropriate manual numerical scoring procedures and rules that increased the accuracy of chart evaluations and polygraph examination findings (Matte 1996: 39-62; Nelson 2009: 53).

The advent of portable computers and the digital age has played a huge role in the development and refinement of the polygraph instrument and the manner in which polygraph charts are generated, evaluated and stored. The most significant achievement in this regard has been the development of computerised chart scoring programmes that can be used by the polygraphist to independently evaluate and numerically score polygraph charts. This allows the polygraphist to generate a second or third opinion (finding) concerning a set of polygraph charts that he has already manually scored. In this manner the accuracy of a polygraph examination findings can be increased and assured (Matte 1996: 87).

The following four polygraph instrument manufacturers in the United States of America continue to dominate the international polygraph instrument and software industry (Matte 1996: 102):

- Axciton Systems, Texas, USA (Axciton 2010:1);
- Lafayette Instrument Company, Indiana, USA (Lafayette Instruments 2010:1);
- Limestone Technologies, Virginia, USA (Limestone 2010:1); and
- Stoelting, Illinois, USA (Stoelting 2010:1).

According to Matte (1996: 5), Russia was producing two polygraph instruments, the Inex and the Avex in 1993 but both instruments appear to have become redundant. The following three polygraph instrument manufacturers currently offer polygraph instruments and polygraph software for sale outside the USA:

- Areopagus-Center LLC, Professional Computer Polygraphs, Moscow, Russia (Areopagcentr 2010: 1);
- Polygraph Technology Asia, Singapore (in conjunction with Lafayette Instrument Company) (Polygraphis 2010: 1); and
- XinKeYong Chuang Company Ltd, Beijing, China (China Polygraph 2010: 1).

3.3.2 International polygraph associations

According to the European Polygraph Association website (European Polygraph Association 2008: 1) the ‘International Society for Detection of Deception’ (ISDD) was established in 1948 by the American polygraphist Cleve Backster, and is generally regarded as the first international polygraph association to have been established worldwide.

In 1966, the APA was established in the USA. The APA is today the largest polygraph association worldwide and makes the largest and most significant scientific contribution to the ongoing research and development of the international polygraph profession. The APA is a voluntary body with its headquarters in Maryland, USA. Association members continually conduct and publish very valuable research on all aspects of polygraphy in the APA quarterly publication, 'Polygraph' and bi-monthly 'APA magazine". In addition, the APA regularly publishes special editions on many aspects of polygraph practise and procedures.

In 2009, the APA had over 3200 members in 48 countries around the world. The following list (in order of membership numbers) represents the ten countries with the largest APA membership (APA 2009: 337-353):

United States of America	2 500
South Africa	93
Israel	43
Canada	40
Columbia	34
Mexico	28
Taiwan	13
United Kingdom	10
Singapore	9
Australia	6

The APA membership directory for 2009 did not list any polygraphists operating in China. Matte (1996: 33-34) estimated that China had in the region of 50 polygraphists in 1996 but very few, if any, appear to have undergone polygraph training outside China.

According to the website 'Polygraph Bulletin' (Pavlov 2010: 1) polygraphy has been utilised in Russia since 1975. In 1993, The Ministry of Internal Affairs of Russia established the 'Institute of Criminalistics' at the Center of Special Technologies in Moscow to focus on various forensic sciences, including polygraphy. This development negated the need for Russian polygraphists to travel to the USA for polygraph training or to maintain membership of the APA. Only two polygraphists from Russia were listed in the APA membership directory for 2009 (APA 2009: 347).

The American Association of Police Polygraphists (AAPP) website (AAPP 2010: 1) lists forty-seven states in the USA, having local polygraph associations. They also list the following international polygraph associations; the Canadian Association of Police Polygraphists (CAPP) in Edmonton, the Israel Polygraph Examiners Association (IPEA) in Tel-Aviv, the Latin American Polygraph Association (LAPA) in Caracas, Venezuela, and the National Polygraph Association (NPA) in Indiana, USA.

The European Polygraph Association (EPA), based in Madrid, Spain lists 107 international members on its website for the year 2012 (EPA 2012: 1). The British and European Polygraph Association (BEPA 2010: 1) lists sixteen British members, 42 European members, most of which are Israeli, Spanish or Eastern European in origin, and 120 international members, the majority being American or South Africans.

Polygraphists in South Africa rely very heavily on the ongoing research published by the APA, and membership of this organisation is essential if any polygraphist wishes to stay abreast of the latest scientific and operational developments in this profession. No research dealing with the validity and reliability of polygraph examinations in particular has ever been published in South Africa (PSSA 2010: 1).

3.3.3 International polygraph training

In 1951, the United States Army Polygraph School (APS) was established. It was renamed the United States Department of Defence Polygraph Institute (DoDPI) in 1975, and in August 2010, renamed the National Center for Credibility Assessment (NCCA). NCCA has played a very valuable role in refining polygraph techniques, testing procedures and test question formats over the past half century. The NCCA trains all US federal polygraphists for the Federal Bureau of Investigation (FBI), the Central Intelligence Agency (CIA), the Defence Intelligence Agency (DIA) and all other federal law enforcement agencies in the USA. Today NCCA continues to set the standards for polygraph training throughout the world and makes a very significant contribution to ongoing scientific research and development of polygraphy. The Argosy University in Washington DC will accept graduate credits obtained at the NCCA towards their Masters degree in Forensic Psychology (specialising in Forensic Psychophysiology) (NCCA 2010: 1).

Currently 23 polygraph 'schools' as they are referred to in the United States of America, offer polygraph training accredited and endorsed by the APA. Fifteen of these schools are located in the USA while the balance are located outside the USA, but operate under the strict auspices and constitution of the APA. As will be discussed in detail below, two polygraph schools, the American (Argenbright) International Institute of Polygraph (AIIP) from Morrow, Georgia and the Academy for Scientific Investigative Training (ASIT) from Philadelphia, Pennsylvania have been presenting polygraph courses in South Africa since 1998 (APA 2009: 388-392).

In 1996, the 'Polygraph Specialists Qualification School' was set up at the Institute of Criminalistics at the Center of Special Technologies (ICCST) in Moscow, Russia initially to provide polygraph training to Russian law enforcement and counter-intelligence agencies, but now also train polygraphists for the private sector in Russia. To date, over 200 polygraphists have reportedly been trained at this facility (Pavlov 2010: 1).

As far as China is concerned, very little information concerning their polygraph training facilities or the number of polygraphists operating in that vast country are known. Matte (1996: 6) stated that in 1996, the Chinese authorities expressed an intention to eventually have at least one polygraphist for each of their 3000 police districts. It could not be established what the current figures are in this regard, but it is estimated by the researcher that the number of polygraphists operating in China is probably at least 300 in number.

3.3.3.1 The basic polygraph examiner's course

The APA accredited training program for Polygraph Examiners has changed very little in the past fourteen years, with the same subjects making up the curriculum (Slupski 2010: 1; Slupski 2010a: 1).

Only polygraphists who have completed an APA accredited polygraph course may become a member of the APA. Chapter 5 of Division V: Membership of the APA Bylaws states that an applicant applying for full membership must have graduated from an APA accredited school, have completed at least 200 actual polygraph examinations using a standardised polygraph testing technique and have completed a Bachelors degree (APA 2010: 9).

An APA accredited basic polygraph course is usually of ten-week full-time duration and comprises of 400 hours of training. Some schools offer the course over eight weeks, followed by a two-week supervised practical internship. The basic APA accredited course covers the following subjects:

Subject:	Hours allocated:
Introduction to polygraphy	4
History of polygraphy	8
Ethics in forensic psychophysiology (polygraphy)	8
Pre-test interview procedures	8
Post-test interviews and interrogations	8
Test question construction/formulation	24
Polygraph instrumentation	24
Chart evaluation and test data analysis	48
Pre-employment screening examinations	8
Sexual-offender examinations	16
Polygraph testing techniques	47
Development and application of polygraph skills	47
Computer/digital polygraph applications	24
Legal issues concerning polygraphy	8
Expert witness testimony	8
Internal affairs polygraph issues	8
Psychological issues concerning polygraphy	24
Physiology issues concerning polygraphy	24
Examination and performance evaluations	18
Course administration and study	36
TOTAL:	400 hours

(Jennings & Slupski 1997: 1(1)2)

In order to incorporate polygraphists who may have received their polygraph training many years ago or do not entirely meet the current requirements for full membership, the APA has instituted a process that recognises prior learning and prior polygraph experience. In this manner, the APA has sought to incorporate as many qualified and experienced polygraphists

as possible into the membership of the APA, to maintain minimum standards and to promote best practices in the profession (APA 2010: 10-11).
The EPA, BEPA and both South African polygraph associations referred to in section 3.4.3 below, subscribe to APA standards (EPA 2012: 1; BEPA 2010: 1).

3.3.4 Regulation of the polygraph industry in the USA and abroad

In 1988, the Employee Polygraph Protection Act (EPPA) was passed in the USA to restrict and regulate the use of polygraph testing for pre-employment and employee security screening purposes in the private sector in the USA. Only certain individuals in the protective security and cash-in-transit industries, pharmaceutical industry or other high-risk industries, or individuals suspected of work-place crime where that employer has suffered economic loss, can be requested to undergo polygraph testing (EPPA 2003: 1).

In twenty-eight states in the USA, State Licensing Boards exist to regulate polygraph testing and the polygraph industries in the states concerned (APA 2009a: 1-3).

Russia, Canada, Australia and most recently India have adopted legislation regulating the use and application of polygraph testing. All European Union countries adhere to the Conversion on Human Rights that advocate treating individuals with dignity and respect within the parameters of the law. In general, all the above subscribe to the codes of ethics and practises advocated by the APA, and therefore have a uniformed approach in this regard (BEPA 2010: 1; Pavlov 2010: 1)

3.4 THE ORIGIN AND DEVELOPMENT OF POLYGRAPHY IN SOUTH AFRICA

Polygraphy has been utilised extensively for over thirty-four years in the private sector and for over thirty years by some government institutions in South Africa. Polygraphy has been utilised in particular, as a tool to screen staff appointed in sensitive government positions, to prevent crime and espionage against the state and to investigate crime and acts of dishonesty in the workplace. In recent years, there has been a significant increase in its use for pre-employment and personnel screening purposes in particular (Christianson 1998: 1&10).

3.4.1 Polygraphy in the private sector

Private polygraphist and psychologist Brenda Selkon, who reportedly conducted polygraph examinations in Johannesburg for Fidelity Guards (Pty) Ltd, the security division of the

Rennies Group as far back as 1978, appears to have been the first polygraphist to conduct polygraph testing in South Africa. The earliest references to Selkon appeared in an article published in the *Security Focus*, the official mouthpiece for the South African security industry, in 1987 (Anon. 1987: 125). According to Matte (1996: 66-67), Selkon apparently received her polygraph training from the Reid College in the United States of America. Unfortunately, no further record of Selkon could be found and she appears to have disappeared into obscurity by the early 1980's. All attempts by the researcher to locate her for this research proved unsuccessful.

In early 1981, a second private polygraphist Gerald William Higgins qualified as a polygraphist at an unnamed polygraph school in the United States of America and proceeded to conduct polygraph examinations primarily for the Employers Mutual Protection Service (EMPS), a subsidiary company of Lodge Service Holdings, in Johannesburg (EMPS 2010: 1). Higgins was a former South African Police (SAP) official and indicated at the time that Lodge Service Holdings had acquired three polygraph instruments to be utilised by EMPS in Johannesburg, Cape Town and Durban (Gericke 1984: 1).

In 1985, Higgins was to make polygraph history in South Africa. He was charged and prosecuted for contravening section 37(2)(c) of the then Medical, Dental and Supplementary Health Services Professions Act (soon after renamed the Health Professionals Act), 56 of 1974 and Government notice R1862 dated 16 September 1977, the regulation that defined the scope of the profession of psychology in terms of the aforementioned Act. The Board of Psychology of the then South African Medical and Dental Council (soon after renamed the Health Professions Council of South Africa (HPCSA)) had laid charges against Higgins for conducting polygraph examinations and using a polygraph instrument in a manner that they believed contravened the aforementioned Act. Section 37(2)(c) of Act 56 of 1974. Section 37 of the Act stipulated that only qualified psychologists were permitted to conduct prescribed psychological tests and that all such practitioners were required to register with the HPCSA in general, and the Board of Psychology in particular (Anon. 1987a: 125).

Higgins appealed his conviction. During the appeal, further submissions were made to the court by representatives of the Board of Psychology to further substantiate the charges against Higgins. The expert witness testimony submitted for the defence by neuropsychologist and University of the Witwatersrand professor, Dr H.L Holdstock (1985:

1-3) however convinced the court otherwise. Holdstock set a legal precedent in South Africa by successfully arguing that polygraphy was essentially a law-enforcement investigation tool and did not fall within the exclusive domain of psychology.

On 25 November 1986, the Johannesburg Regional Court ruled that section 37 of Act 56 of 1974 and Government notice R1862 did not apply to polygraphists using polygraph instruments as an investigation tool to determine truth and deception. Higgins was subsequently found 'not guilty' and discharged by the court (Lieberum 1986: 1).

The researcher had hoped to interview Higgins for this study, but was informed during a telephone interview with Kevin Condon (Condon, 2010) on 27 November 2010 that Higgins had unfortunately passed away 1990.

Polygraphist Gys Du Preez, the Managing Director of Polysure (Pty) Ltd in Pretoria stated during a telephone interview on 17 November 2010 (Du Preez, 2010) that his own research had also identified Selkon and Higgins as being the first two polygraphists in South Africa to conduct polygraph testing in the private polygraph industry in South Africa.

In 1991, polygraphist Kevin Condon, a former-police officer and member of Lodge Services (Pty) Ltd, a security company operating in Johannesburg at the time, received his polygraph training at the Backster School of Lie-Detection in San Diego, California in the United States of America (Lamberti 1999: 1). Condon conducted pre-employment and specific-issue polygraph examinations for companies in the private sector but left Lodge Services in 2008 after a polygraph career spanning 24 years (Matte 1996: 66-67). Condon still offers polygraph testing today, through his business, Condon Investigative Solutions in Cape Town and appears to be the longest serving private polygraphist still active in South Africa (Condon 2012: 1).

On 1 July 1999, the issue of polygraphy and polygraph testing again came under public discussion and legal scrutiny. Dr Saths Cooper, the chairperson of the Professional Board of Psychology (PBS) of the HPCSA at the time chose to make uninformed statements to the media concerning the legality and validity of polygraph testing in South Africa. Cooper had stated during an interview with the media that polygraph testing (lie-detector tests) was illegal in South Africa in terms of the Medical, Dental and Supplementary Health Service

Professions Amendment Act, 89 of 1997 and that any individual conducting polygraph testing was in contravention of the law (Anon. 1999: 1 ; Anon. 1999a: 1).

In order to enlighten Cooper and to resolve this matter, a copy of the judgement handed down by the Johannesburg Regional Court in 1986 in the Higgins case discussed above, was brought to Cooper's attention by representatives of the local PASA. Later in 1999, Cooper was invited to a meeting with representatives of PASA, polygraphists from the SAPS, Military Intelligence, the NIA and SASS. He was given a detailed briefing on the role and activities of the broader polygraph industry as well as its extensive use by both the private sector and the government institutions mentioned above. After extensive discussions, Cooper acknowledged the polygraph industry's status in terms of the law. He undertook to retract his incorrect public statements and to set the record straight, in order to remove any confusion in the public domain. Unfortunately, Cooper nor any representative of the HPCSA ever retracted the incorrect public statements made earlier.

3.4.2 South African government institutions using polygraphy

In 1980, two members of the former NIS were sent to Israel to undergo polygraph training at the Polygraph Institute of Israel. This appears to be the earliest record of any government official receiving polygraph training under the auspices of a South African government institution. Wietse Van Wyk De Vries (Van Wyk DeVries, 2010), one of the two polygraphists concerned, indicated during a telephone conversation on 17 November 2010 that he was very sure that no other South African intelligence or military official had ever undergone polygraph training prior to 1980.

Van Wyk De Vries mentioned that he and his colleague only conducted polygraph examinations periodically for counter-intelligence and counter-espionage purposes after their training, because polygraph testing had not yet been fully incorporated into the NIS pre-employment vetting or screening process at that stage. Van Wyk DeVries and his colleague redeployed to other operational duties in the ensuing years and unfortunately did not play any significant role in later the development of polygraphy in the NIS (Van Wyk DeVries, 2010).

In 1985, a group of eight NIS members underwent polygraph training with the Polygraph Institute of Israel. The NIS initially encountered some difficulty in commercially acquiring additional polygraph instruments for these new members, due to international anti-aparheid

sanctions prohibiting the export of polygraph equipments to South Africa. This problem was however quickly resolved by 'operational' means and the newly qualified polygraphists were able to get to work. These polygraphists focussed primarily on counter-intelligence and counter-espionage matters (Malan, 2010).

In 1986, the NIS recruitment and personnel vetting policy was extended to include pre-employment polygraph screening and periodic polygraph testing at all levels. In order to meet this challenge, a formal and independent polygraph section was established to deal with pre-employment and periodic screening of NIS staff. A further seven members of the NIS were sent to undergo polygraph training with the Polygraph Institute of Israel and in late 1986 all qualified as polygraphists (Du Preez, 2010; Malan, 2010).

Over the subsequent ten years, more groups underwent polygraph training to deal with the increased vetting and investigation needs of the NIS and NIA (Van Rooyen, 2011; Malan, 2010).

During 1990, the MID of the Chief of Staff: Intelligence of the former South African Defence Force (SADF) sent five military officers to undergo polygraph training at the Polygraph Institute of Israel. These polygraphists were also utilised to conduct pre-employment screening and periodic re-vetting polygraph examinations, and for counter-intelligence purposes within the SADF environment. No information is available for the period 1991 to 1997, but in 1998, the newly established South African National Defence Force (SANDF) sent nine Military Intelligence officers for polygraph training (Lessing 1998: 1).

In early 1996, the newly established SASS sent two members to the AIIP in the USA to undergo polygraph training. These members were the first SASS polygraphists to receive polygraph training abroad in the post-apartheid era and they returned to develop the first polygraph section in SASS. Later in 1996, the first multi-racial group of SASS members was despatched by the researcher, in his capacity as the divisional head of the section concerned, to the AIIP in the USA to undergo polygraph training. In the following year, an entirely 'black' group of SASS students representing the 'new-South Africa' was sent by SASS to the AIIP in the USA for polygraph training.

In 1998, local polygraph history was made. The SAPS, who did not have any polygraph testing capacity at that stage, commissioned the AIIP to present a course in South Africa. The SAPS co-ordinated the polygraph course and it was presented at the SAPS Detective Academy in Silverton, Pretoria. The course was the first of its kind ever presented by any foreign private polygraph institution in South Africa. The course group consisted of ten police officers selected from the ranks of the SAPS and nine military officers selected from the MID. At the conclusion of the course, the SAPS 'Electronic and Polygraphic Unit' was formally established on March 1998 in Pretoria under the command of the SAPS Forensic Science Division. Brigadier Johan Claassens was duly appointed as its first Director (Lessing 1998: 1).

The AIIP continue to visit South Africa annually to present basic polygraph courses and specialised courses on 'post-conviction sexual offender' (PCSO) testing (Slupski 2010a: 1).

A second polygraph company from the USA, the ASIT based in Philadelphia, soon followed suit and presented their first basic polygraph course to sixteen private sector students in Johannesburg in 1998. The ASIT now also offer basic polygraph courses in South Africa annually, as well as specialised courses in post-conviction sexual offender testing (PCSO) and forensic assessment interviewing techniques (FAIT) (Gordon 2010: 1).

3.4.3 Polygraph associations in South Africa

In 1995, PASA was established by a group of ten polygraphists, half of whom worked within the government intelligence environment and the remainder being from the private sector. This event marked a significant development in the South African polygraph community. It was prompted by the desire to establish a code of ethics and code of practise for polygraphists plying their trade in South Africa and to facilitate an exchange of operational experience between active polygraphists in the country (Du Preez, 2010).

Since 1995, the polygraph industry in South Africa has grown in leaps and bounds. In 1995, thirteen polygraphists were active in the country and by 1997, the number of polygraphists registered with PASA had grown to 45 members. PASA currently has 62 members, almost all from the private sector (PASA 2010: 1).

In 2000, the second polygraph association, SAPPA, referred to above was established. The SAPPA website currently lists 79 members, the majority representing the private sector, but approximately fifteen represent law enforcement and government agencies (SAPPA 2010: 1).

Approximately 93 South Africans polygraphists are currently members of the APA, with 75 representing the private-sector, while the remainder represent local law enforcement agencies and various government institutions (APA 2009: 347-351).

In March 2010, a joint meeting was held by the representatives of both associations in an attempt to consolidate PASA and SAPPA under one umbrella. Unfortunately, the consolidation process did have the desired effect. When interviewed in January 2011, Hendrik Van Rooyen, who was one of the original convenors representing PASA, was pleased to announce that the consolidation process was back on track. A Section 21 company (non-profit organisation) had been registered, to accommodate a new association, the 'Southern African Polygraph Federation' (SAPFED). It is envisaged that SAPSED will eventually become the new body representing all polygraphists in South Africa (Van Rooyen, 2011).

3.4.4 Regulation of the polygraph industry in South Africa

No specific legislation or regulations are in place to regulate the polygraph industry in South Africa. As described above, the industry is essentially self-regulated and relies heavily on the integrity of polygraphists to comply with the professional polygraph practises that are advocated by the APA and the local polygraph associations (APA 2010: 1; SAPPA 2010a: 1).

The Commission for Conciliation, Mediation and Arbitration (CCMA) has however issued guidelines (see Annexure G) that emphasise many of the important standards endorsed by the APA Code of Practise and Code of Ethics discussed above. Since 2008, the South African Labour Guide has also included these guidelines as part of their 'Labour Law and Employment manual', published bi-annually (Rheeder 2010: 1).

In early 1999, the Interim Security Officers Board (ISOB), since renamed the Private Security Industry Regulatory Authority (PSIRA) in terms of the Private Security Industry Regulation Act, 65 of 2001, called for submissions to amend the Security Officers Act, 92 of 1987. In February 1999 and March 2000 the researcher made submissions requesting that

'polygraphists or polygraph examiners' be registered as a special category of security officer in order that the polygraph profession, polygraph industry and polygraph training could be regulated. The authors of the new Act (Act 65 of 2001) chose however not to include any clauses to regulate polygraphy or the polygraph industry. The polygraph industry therefore relies purely on self-regulation under the guidance and auspices of PASA (now SAPFED), SAPPA and the APA.

3.4.5 Polygraphy and South African Labour Law

A number of post-graduate students and academics in the fields of labour law in particular, have published very useful research articles and academic papers addressing the evidentiary role and legal status of polygraphy within the context of South African Labour law.

In 1998, an article was written by a senior lecturer in the Department of Mercantile Law at the University of South Africa (UNISA), Marylyn Christianson and published in the Contemporary Labour Law Journal in 1998 (Christianson 1998: 1-10). Christianson made a very valuable contribution towards a better understanding of the role of polygraph testing within the context of new post-apartheid labour legislation, such as the Basic Conditions of Employment Act, 75 of 1997, the Employment Equity Act, 55 of 1998 and the Labour Relations Act, 66 of 1995. Christianson's contribution was highly appreciated within the polygraph fraternity because she introduced polygraphy to the legal fraternity in a positive manner and opened the debate on the role of polygraph evidence in labour disputes.

In 2001, post-graduate student Raymond Martin published a dissertation for the degree MA at UNISA that examined the application of the polygraph in the South African Criminal Justice System (Martin 2001: 1-254). Martin discussed many of the legal aspects and labour issues previously raised by Christianson but again raised the fact that the courts had never defined the role that polygraph results should play in the courts and criminal justice system. This dissertation was widely welcomed in the local polygraph industry because it was the first comprehensive academic study of polygraphy in South Africa, all be it within the context of labour law.

In the same year, Colin Tredoux a senior lecturer with the Department of Psychology at the University of Cape Town and research student Susan Pooley, also with the Department of Psychology at the University of Cape Town published an evaluation and commentary on

polygraph-based testing of deception and truthfulness. This article was very critical of the use of polygraphy as a pre-employment or investigation tool and questioned its role, accuracy and reliability (Tredoux & Pooley 2001: 1-19). Tredoux and Pooley questioned the ethics, integrity and experience of polygraphists conducting polygraph examinations and seemed to hold the view that polygraphists and businesses often manipulated the polygraph procedures and exploited the opportunity to find innocent examinees 'guilty'. They advocated strict legal regulation and control of the polygraph industry, something that most polygraphists support, to eliminate abuse of examinees. Fortunately, the uninformed radical views that Tredoux and Pooley hold are not common, but are understandable given the many misconceptions that prevail around polygraphy. This article reminded the polygraph fraternity of the importance of educating the public about these

matters, to dispel uninformed opinions and to emphasise the positive role that polygraphy plays in preventing and investigating crime. It also emphasised the importance of promoting strong ethical and impartial values that should underpin the polygraph profession in particular.

In 2002, Charl Celliers and UNISA post-graduate student, Raymond Martin published a article in *Acta Criminologica: Southern African Journal of Criminology*, the journal of the Criminological and Victimological Society of Southern Africa (CRIMSA) dealing with polygraphy. The article focussed on the use of polygraphy in the private sector and the procedures followed during a polygraph examination. The article also discusses the benefits to the private industry in as far as promoting honesty and integrity in the workplace was concerned (Cilliers & Martin 2002: 134-140). This article served to introduce polygraphy to the academic members of CRIMSA, many of whom lecture on criminology and policing at universities throughout South Africa. These academics would normally not be very familiar with polygraphy and polygraph procedures.

In 2002, an article on polygraphy was published on the CCMA website by Kerry Knowles (Knowles 2002: 1). Knowles discussed the accuracy and premise upon which pre-employment polygraph testing is founded and she reviewed the accuracy of various test question formats commonly used in South Africa. The article was by-and-large very positive and placed the polygraph fraternity in a good light in as far as the CCMA was concerned.

In 2003, Celliers and Martin published a second article in *Acta Criminologica* on the subject of polygraphy (Cilliers & Martin 2003: 94-107). This article focussed on the role of polygraphy in the criminal justice system and again addressed a number of the issues dealt with in Martin's MA dissertation, mentioned above. It also focussed on the use of polygraphy in South Africa as a pre-employment screening tool and its role in criminal investigations. The role of polygraphy in monitoring paroled sexual offenders in the USA and the cautious approach currently adopted by the South African criminal justice system with regard to its admissibility in the courts, was also discussed. As in the case of the previous article published by Celliers and Martin in 2002, this article introduced new aspects concerning polygraphy to the academic members of CRIMSA and lay the foundation for further academic debate on the subject.

In 2004, post-graduate student at the North-West University (Potchefstroom), Niko Louw published a mini-dissertation for the degree LLM (Labour Law) exploring the use of polygraphy in the South African employment law (Louw 2004: 1-45). Louw's dissertation addressed various legal aspects, including the admissibility of polygraph results, testing accuracy and the reliability of polygraph results. He concluded, as a number of previous researchers have done, that the legal position, evidentiary status and the role of polygraph evidence required further clarification by the justice system and the courts. While not providing any new research on any operational aspects related to polygraph procedures or the operational obstacles encountered by polygraphists in the field, Louw did emphasise that polygraphy remained a valuable crime-prevention and investigation tool.

In 2007, post-graduate student at the University of Cape Town, Ronel Prinsloo published a dissertation for the degree LLM (Labour Law) exploring the use of polygraphy in the workplace and the role of polygraph examination results as evidence in labour disputes in South Africa. Her dissertation provided additional clarity on a number of legal issues concerning polygraphy and polygraph evidence. Prinsloo concluded, as a number of researchers have done before, that the legal position, evidentiary status and the role of polygraph evidence still needed to be properly clarified by the justice system and the courts. Prinsloo endorsed polygraphy as a valuable tool to prevent and investigate crime (Prinsloo 2007: 77).

In 2010, post-graduate student at the University of Pretoria, Daniel Calaca published a dissertation for the degree LLM (Labour Law) (Calaca 2010: 1-57). As in the case of Prinsloo, Calaca also explored the use of polygraph tests and polygraph examination results in labour disputes in South Africa. In addition to South Africa, Calaca explored the utilisation of polygraphy in the USA, United Kingdom, Canada and Australia. He expressed concern that the local polygraph industry was not regulated by statute and that the minimum standards for individuals operating as polygraphists were not stipulated or enforced. Calaca (2010: 47&49) advocated the establishment of a statutory body to regulate the local polygraph industry and to ensure that polygraphists are properly qualified and only used validated polygraph testing formats. Calaca's contribution again reminded the polygraph fraternity that they should promote the statutory regulation of the industry, to ensure that its professional status is upheld.

The research findings and articles referred to above have all made a significant contribution to the understanding of polygraphy within the context of Labour Law in South Africa. Further research on its role within the Criminal Law context and on the operational circumstances associated with polygraphy is however long overdue. This subject is discussed later in this document.

3.5 THE DEVELOPMENT AND UTILISATION OF POLYGRAPHY IN THE LIMPOPO PROVINCE

3.5.1 Orientation to the Limpopo Province

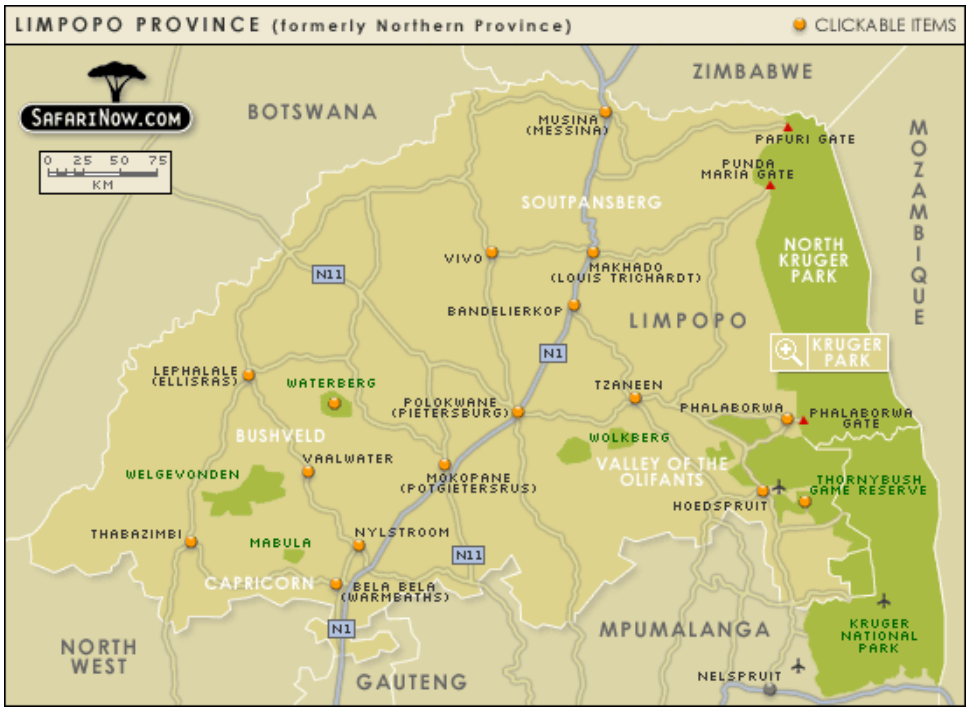
The Limpopo Province is one of nine provinces of the Republic of South Africa and is located in the northern part of the country: see Map 1.

Map 1: South Africa with nine provinces

(Geology.com 2010: 1)

The Limpopo Province in turn covers a geographical area of 123 910 square kilometres: see Map 2 (GoLimpopo 2010: 1).

Map 2: The Limpopo Province, South Africa



(Limpopoinfo 2010: 1)

In July 2010, the population of the Limpopo Province was estimated by Statistics South Africa to be 5 439 552 (almost 11% of the total population of South Africa) (StatsSA 2010: 1): see Table 1.

Table 1: Mid-year population estimates by province for 2010

PROVINCE	POPULATION	PERCENTAGE
Eastern Cape	6 743 823	13,49%
Free State	2 824 570	5,65%
Gauteng	11 192 029	23,39%
KwaZulu-Natal	10 645 508	21,29%
Limpopo	5 439 552	10,88%
Mpumalanga	3 617 513	7,24%
Northern Cape	1 103 918	2,21%
North West	3 200 649	6,40%
Western Cape	5 223 908	10,45%
TOTAL	**49 991 470**	**100%**

(StatsSA 2010a: 1)

3.5.2 Background to polygraphy in the Limpopo Province

Prior to 2000, no polygraph company operated an office on a semi-permanent or permanent basis in the Limpopo Province.

Businesses, companies and clients operating or located in Limpopo Province utilised the services of polygraph companies from elsewhere in the country, most often from Gauteng Province (Own research).

3.5.3 First presence

In 2000, Astrid Botha, a polygraphist who had completed a polygraph course in late 1999 presented in Johannesburg by a visiting polygraph instructor affiliated to the National Centre for Polygraph Studies in Mexico, established the first polygraph company in the Limpopo Province (Botha, 2010).

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Botha had a background in insurance fraud but held no academic qualifications relevant to criminal investigations or polygraphy. She established Polygraph and Lie-Detection Limpopo cc and operated from her home in Haenertsburg, a small town approximately sixty kilometres east of Polokwane, Limpopo's provincial capital.

Botha operated throughout the province and when interviewed in June 2010, (Botha, 2010) indicated that approximately 90% of the polygraph examinations that she conducted over that period were specific-issue or crime-related polygraph examinations, while pre-employment personnel screening polygraph examinations made up a mere 10% of her polygraph activities.

Botha's services were utilised most frequently by the private security industry, the cash-in-transit and guarding services in particular, the commercial banks and other financial institutions, the courier industry, the farming industry and agricultural sector, and a diverse variety of retail outlets.

According to Botha, in the vast majority of cases, the clients she assisted had suffered the theft of money or company stock, or in the case of the farming industry and agricultural sector - livestock or consumable crops. In most cases the examinees tested were employees of the client requesting the polygraph examinations.

After having operated in Limpopo Province for over eight years and having conducted in excess of 1 000 polygraph examinations, Botha retired from the industry and closed down Polygraph and Lie-Detection Limpopo cc in December 2008.

3.5.4 Second presence

In late 2002, a second polygraph company, Northern Polygraph Services cc was established in Polokwane. The owner was then-recently retired SAPS detective, Colonel Ockert Nortje.

Nortje had recently completed a polygraph course in Pretoria, presented by visiting polygraph instructors from the AIIP. As a former police detective, Nortje had extensive experience in criminal investigations and held a National Diploma in Policing (Nortje, 2010).

Nortje operated throughout the province and stated that approximately 70% of the polygraph examinations that he conducted between 2002 and 2007 were specific-issue or crime-related

polygraph examinations while pre-employment personnel screening polygraph examinations made up approximately 30% of his workload.

Nortje, who operated out of an office located at a local security company, Securipro Security Services in Polokwane, was utilised most frequently by the security industry - the cash-in-transit and guarding services in particular. The commercial banks and other financial institutions, the courier industry, the mining industry and a diverse variety of retail outlets also used his services frequently.

Local personnel recruiting companies who provide staff to businesses throughout the province most frequently requested pre-employment screening polygraph examinations conducted on certain categories of staff they offered.

As with Botha's experience above, the vast majority of cases attended to in the Limpopo Province concerned the theft of money or company stock by employees of the client requesting the polygraph examinations.

In August 2007, Nortje opted to retire from the profession and closed down Northern Polygraph Services cc for business. He had operated in Limpopo Province for over five years and had conducted an estimated 700 polygraph examinations during that period.

3.5.5 Third presence

In March 2006 a third polygraph service, the Polygraph Division, was established in Polokwane by a local security company, Urban Africa Security (Pty) Ltd. Urban Africa had sent a staff member, Dirk Human, to attend a polygraph course in Pretoria presented by visiting polygraph instructors from the ASIT.

Human had previously served for ten years in the SAPS, had over eight years of experience in the security industry, but he held no academic qualifications relevant to polygraphy (Human, 2010).

Human operated primarily in Polokwane but sometimes conducted polygraph examinations elsewhere in Limpopo province. The majority of the polygraph examinations he conducted were to satisfy the pre-employment screening needs of his employers at Urban African and he

operated from the company's Polokwane offices. He estimated that approximately 65% of the polygraph examinations that he conducted were pre-employment personnel screening polygraph examinations while specific-issue or crime-related polygraph examinations made up only 30% of his workload.

Human's services outside Urban African were utilised most frequently by the security industry - the cash-in-transit and guarding services in particular, the courier industry and a diverse variety of retail outlets. As had been the case with Botha and Nortje, the vast majority of specific-issue or crime- related polygraph examinations conducted by him were to investigate the theft of money or company stock by employees of the client requesting the polygraph examinations.

Urban Africa closed their Polygraph Division for business in December 2007 after a labour dispute with Human. Human left Urban Security's employ shortly thereafter. Human estimated that he had conducted approximately 300 polygraph examinations between March 2006 and December 2007 (Human, 2010).

3.5.6 Fourth presence

In April 2006 a fourth polygraph company, The Polygraph Professionals cc, which had been established by the researcher in Pretoria, Gauteng Province in 1997, opened for business in Polokwane after relocating to that province.

The researcher had attended a polygraph course at the AIIP in September 1997 and commenced polygraph testing in Centurion, Gauteng Province after returning to South Africa in December 1997. He had previously served for twenty years in the South African Intelligence Community, including the MID, the NIS/NIA and SASS, before resigning in April 1997 on the level of Director (Brigadier). He has over 20 years of operational experience in criminal, counter-intelligence and counter-espionage investigations as well as thirteen years of experience in the private security and polygraph industry in South Africa.

The researcher holds an Honours degree in Criminology, a Bachelor degree in Police Science, a Bachelor degree in Criminology and African Politics, and has completed a three-year Advanced Programme in Security Management, all from UNISA.

He has conducted in excess of 2 500 polygraph examinations to date with over 1 500 polygraph examinations conducted in Limpopo Province alone. The Polygraph Professionals cc operates from the researcher's private residence approximately thirty kilometres south of Polokwane.

The details concerning the operational activities of the researcher form the basis of the subsequent chapters.

3.5.7 Fifth presence

In December 2007 a fifth polygraph company, PM Polyforensic Services cc, was established in Bela Bela (formerly Warmbaths) by polygraphist Philip Minnaar (Minnaar, 2010).

Minnaar had attended a polygraph course at the AIIP in 1998 and had previously conducted business in Gauteng. He had served for nine years in the NIS/NIA and had over nine years of experience in the polygraph industry. He holds no academic qualifications relevant to polygraphy.

Minnaar operated primarily in Gauteng (80% of his examinations having been conducted there) but estimated that approximately 20% of the polygraph examinations he had conducted were done in the Limpopo Province. He conducted an estimated 120 polygraph examinations between December 2007 and December 2008.

Minnaar also estimated that approximately 60% of the polygraph examinations he conducted during that period were specific-issue or crime-related, while pre-employment personnel screening polygraph examinations made up 40% of his workload. As had been the case with the other polygraphists consulted, the specific-issue or crime-related polygraph examinations conducted by Minnaar were predominantly to investigate the theft of money or company stock by employees of the client requesting the polygraph examinations.

Minnaar operated from his private residence outside Bela Bela but decided to close down his business in December 2008 because of insufficient work in the area.

3.5.8 Sixth presence

In mid-2008, a sixth polygraph company, Limpopo Polygraphs cc was established by newly qualified polygraphist, Lizette Snyman in Dendron, a small town approximately fifty kilometres north-west of Polokwane (Snyman, 2010).

Snyman had recently completed a polygraph course in Pretoria presented by visiting polygraph instructors from the ASIT. She has a background in the courier industry and logistics but holds no academic qualifications relevant to criminal investigations or polygraphy.

Snyman operates throughout the province. She indicated that approximately 70% of the polygraph examinations that she conducts are for specific-issue or crime-related cases, while pre-employment personnel screening polygraph examinations made up approximately 30% of her workload. She operates from her private residence in Dendron and is utilised by a wide variety of clients but most frequently by the security industry - the cash-in-transit and guarding services in particular, the banks and other financial institutions, the courier industry and a diverse variety of retail outlets.

Local personnel recruiting companies utilise Snyman's services to conduct pre-employment screening polygraph examinations on certain categories of staff they offer for replacement. As experienced by all the other polygraphists mentioned above, the vast majority of cases attended to in Limpopo Province concern the theft of money or company stock by employees of the client requesting the polygraph examinations.

Limpopo Polygraphs cc is currently operational in Limpopo Province and the researcher estimates that Snyman has probably conducted in excess of 500 polygraph examinations to date.

3.5.9 Summary

The number of polygraphists located in Limpopo has changes significantly since 2000: see Diagram 1.

Diagram 1: Changing presence of polygraph services since 2000

POLYGRAPHIST	2000	'01	'02	'03	'04	'05	'06	'07	'08	'09	2010
Botha											
Nortje											
Human											
Watson											
Minnaar											
Snyman											

Botha enjoyed the monopoly for over two-and-a-half years before Nortje entered the local industry in mid-2002. The status quo remained until Human, the researcher and Minnaar entered the local industry. For a period of approximately one year between mid-2006 and mid-2007, no less than four polygraphists were plying their trade in the Limpopo Province.

As confirmed by all the other polygraphists interviewed, the vast majority of cases attended to in Limpopo Province concern the theft of money or company stock by employees of the client requesting the polygraph examinations.

The total number of polygraph examinations conducted in Limpopo Province by the six polygraphists listed above probably exceeds 3820 examinations since 2000: see Diagram 2.

Diagram 2: Number of polygraph examinations conducted since 2000

POLYGRAPHIST	100	200	300	400	500	600	700	800	900	1 000	+1100
Botha											
Nortje											
Human											
Watson											
Minnaar											
Snyman											

If it can be presumed that an equal number of polygraph examinations have been conducted by other polygraphists periodically visiting Limpopo Province from Gauteng or other provinces since 2000, then it would be quite reasonable to estimate that the total number of polygraph examinations conducted to date exceeds well over 7000 in number.

It is evident that polygraph testing is widely used in Limpopo Province. Industries that have a national footprint in particular are more inclined to use polygraphy to combat and prevent crime.

The polygraph industry in Limpopo has been active for over ten years now and has grown in stature and professionalism. There is every reason to expect that it will continue to develop and grow, providing that the demand remains constant and the quality of the service offered are maintained on a very professional level.

3.6 CONCLUSION

The introduction of polygraphy into South Africa around 1978 and the evolution of the private and governments polygraph fraternity in South Africa in the years that followed, has been influenced very significantly by the need to develop additional tools to investigate crime, industrial espionage and to combat inter-government espionage.

The polygraph fraternity in the USA in particular, has played a major role in the sophistication and level of professionalism that the local polygraph industry displays today. The APA also continues to make a huge contribution to the ongoing research and development of polygraph technology, instrumentation, software and testing techniques, and South African polygraphists benefit very much from this.

The South African polygraph industry does however need to consolidate its position in the broader security industry by establishing a united polygraph association that represents all professional polygraphist under one umbrella.

Chapter 4
OPERATIONAL ANALYSIS AND COMPARISONS OF POLYGRAPH EXAMINATIONS

4.1 INTRODUCTION

The purpose of examining the operational utilisation of polygraphy and the circumstances when and where polygraph testing is used in the Limpopo Province, is to provide the reader with a better understanding of the unique challenges and working conditions that prevail in the province. It is also envisages that this novel information will be useful to other polygraphists and security practitioners who are operating in the province. This information is extracted from the 'Polygraph examination interview questionnaires' used when conducting each polygraph examination used in this research (see Annexure A).

The most significant aspects are discussed below:

4.2 EXAMINATION INFORMATION DATA SUB-SETS

4.2.1 Economic sector of clients

The utilisation of polygraph testing in the Limpopo Province is very diverse and almost every economic sector and business industry represented in the province has made use of polygraph examinations at some time: see Table 2.

Polygraph examinations are being utilised as an important pre-employment screening tool to evaluate the honesty and integrity of job applicants during the recruitment of new personnel. Periodic or random screening polygraph examinations on the other hand, are extensively used as a tool to verify the levels of honesty and integrity of existing staff members, to ensure that they still meet the minimum standards required of them by their employers, profession or industry.

Pre-employment screening polygraph examinations and periodic or random polygraph examinations assist clients and businesses to prevent, or at best minimise acts of crime and criminal activity in the workplace. According to Peet Geldenhuys (Geldenhuys, 2010) and David Adonis (Adonis, 2010) the Manager and Assistant-Manager respectively of Polokwane Cash and Carry in Polokwane, the pre-employment polygraph screening process that they

have implemented at the store over the past three years, has contributed significantly to a reduction of internal stock theft and shrinkage, since its inception.

Table 2: Economic sector of the clients

ECONOMIC SECTOR OF THE CLIENTS	Number	%
Wholesale food, supermarkets and dairy industry	252	25.2%
Banks and financial institutions	113	11.3%
Security cash-in-transit and cash payment services	76	7.6%
Courier industry	75	7.5%
Game farming and game lodges	64	6.4%
Vehicle tracking and recovery industry	63	6.3%
Building supplies and construction industry	47	4.7%
Motor vehicle, spares and transport industry	33	3.3%
Office furniture and domestic interiors	30	3.0%
Security guarding industry	29	2.9%
Distilleries, liquor trade and soft drink supplies	29	2.9%
Gas supply industry	26	2.6%
Legal profession and medical industry	25	2.5%
Domestic issues and private individuals	24	2.4%
Electronics industry	23	2.3%
Heavy industry, steel suppliers and scrap metal dealers	19	1.9%
Clothing industry	17	1.7%
Hospitality, entertainment and fast-food industry	16	1.6%
Farming industry and agricultural sector	12	1.2%
Stationary, printing and educational institutions	12	1.2%
Petroleum and oil industry, filling stations	8	0.8%
Jewellery industry	4	0.4%
Mining industry	3	0.3%
TOTAL	**1 000**	**100%**

Crime-related or specific issue polygraph examinations are being utilised extensively in the Limpopo Province as an important forensic tool to:

- investigate cases of missing or stolen assets, stock, money, equipment or other items from the workplace;
- identify criminal collaborators and dishonest staff who have actively assisted criminals to target the assets of a company or client;
- confirm the truth of statements given by witnesses or employees regarding incidents of accidental or deliberate damage to company property and company vehicles;
- verify the truth concerning crimes where employees are suspected of criminal collaboration, such as vehicle hijacking, cash-in-transit robberies or other armed robberies;
- verify the degree of involvement of employees in suspicious events, internal thefts or other cases of criminal behaviour;
- verify allegations of sexual harassment or racial abuse where no other witnesses were present;
- confirm or refute information collected from witnesses; and
- afford innocent suspects the opportunity to confirm their alibi or version of events (see Annexure A).

Specific-issue or crime-related polygraph examinations can be adapted to meet a variety of unique conditions and circumstances. They also play an important role in concluding disciplinary hearings and labour disputes, including cases referred the Commission for Conciliation, Mediation and Arbitration (CCMA) when the polygraph results are used to corroborate other evidence submitted.

The statistics in Table 2 indicate that the following four sectors rank highest and account for over 51% of the total polygraph examination usage in the Limpopo Province:

- the retail food, supermarkets and dairy industry;
- the banks and financial institutions;
- the security cash-in-transit and cash payment services; and
- the courier industry.

The analysed examinations revealed that the retail food industry, supermarkets and the dairy industry rank first and account for the largest number, 25.2% of the polygraph examinations

evaluated by the researcher. When examined in more detail by type of examination category, this sector's utilisation of the polygraph examinations is as follows:

- pre-employment polygraph examinations (169) 67%
- periodic or random screening polygraph examinations (10) 4%
- specific-issue or crime-related polygraph examinations (73) 29%

The commercial banks, micro-lenders and other financial institutions account in the sample used for the second highest usage in Limpopo Province, namely 11.3%. When examined by type of polygraph examination, this sector's utilisation of polygraph examinations is as follows:

- pre-employment polygraph examinations (7) 6%
- periodic or random screening polygraph examinations (0) 0%
- specific-issue or crime-related polygraph examinations (106) 94%

The private security industry's cash-in-transit sector and various related cash payment services that handle, transport and distribute money, account for the third highest usage in the province namely 7.6%. When examined in more detail, this sector's utilisation of polygraph examinations is as follows:

- pre-employment polygraph examinations (27) 35%
- periodic or random screening polygraph examinations (5) 7%
- specific-issue or crime-related polygraph examinations (44) 58%

Fourth in the ranking is the courier industry, which accounts for 7.5% of the usage in the province. This sector's utilisation of polygraph examinations is as follows:

- pre-employment polygraph examinations (7) 10%
- periodic or random screening polygraph examinations (21) 28%
- specific-issue or crime-related polygraph examinations (47) 62%

4.2.2 Geographical location where polygraph examinations conducted

The Limpopo Province has five municipal districts. The largest cities and towns where polygraph testing was conducted by the researcher are listed below:

- Capricorn District **–** Polokwane and Lebowakgomo;
- Mopani District – Tzaneen, Phalaborwa and Giyani;
- Sekhukhune District – Groblersdal, Burgersfort, Marble Hall and Jane Furse;
- Vhembe District – Louis Trichardt, Musina and Thohoyandou; and
- Waterberg District – Mokopane, Bela Bela and Thabazimbi (Limpopoinfo 2010: 1).

Polygraph examinations are utilised throughout the length and breadth of Limpopo Province, but most frequently in the largest urbanised and industrialised areas: see Table 3.

Pre-employment and periodic polygraph examinations are used by businesses and clients to prevent crime in the workplace. Where disputes arise or criminal incidents occur within the immediate business environment of the client, they utilise specific-issue or crime-related polygraph examinations to help them resolve the problem at hand or to investigate the crime further.

The statistics in Table 3 indicate that the following four geographical locations rank highest and account for over 73.6% of the total polygraph examination usage in Limpopo Province, with Polokwane and environs featuring very prominently:

- Polokwane industrial areas;
- Polokwane central district;
- Louis Trichardt, Vivo and Dzanani area; and
- Tzaneen, Letsitele and environs.

Table 3: Geographical location where polygraph examinations conducted

GEOGRAPHICAL LOCATION OF EVENTS	Number	**%**
Polokwane Industrial areas	456	45.6%
Polokwane Central District	176	17.6%
Louis Trichardt, Vivo and Dzanani	61	6.1%
Tzaneen, Letsitele and environs	43	4.3%
Hoedspruit, Acornhoek and environs	31	3.1%
Mokopane and environs	30	3.0%
Thabazimbi and environs	30	3.0%
Polokwane rural and farming areas	26	2.6%
Thohoyandou and Malamulele	19	1.9%
Seshego (Polokwane)	17	1.7%
Phalaborwa and Kruger National Park	17	1.7%
Lebowakgomo, Zebediela and environs	16	1.6%
Giyani	13	1.3%
Groblersdal and Marblehall	12	1.2%
Musina	11	1.1%
Steelpoort and Atok	11	1.1%
Burgersfort	10	1.0%
Jane Furse	9	0.9%
Bochum and Dendron	6	0.6%
Bela-Bela	6	0.6%
TOTAL	**1 000**	**100%**

The industrial areas surrounding Polokwane and the industrial area in Seshego, that is located ten kilometres North-West of central Polokwane, account for 47.3% of the total of polygraph examinations conducted in the province.

The central business district of Polokwane represents 17.6% of the total of polygraph examinations utilised, while the surrounding rural and farming areas that fall under the Polokwane municipality account for 2.6% of the total polygraph examinations utilised.

In summary, Polokwane together with its surrounding industrial areas, the industrial area in Seshego, the Polokwane central business district and the immediate rural and farming areas that fall under the Polokwane municipality, account for 67.5% of the total of polygraph examinations utilised in the province.

The balance of the 32.5% of the total polygraph examinations utilised in Limpopo Province are spread quite evenly throughout the remainder of the province larger centres and towns, namely:

- Musina, Louis Trichardt, Dzanani, Vivo, Dendron and Bochum that are located to the north of Polokwane account for 7.8% of the total of polygraph examinations utilised;
- towns located in the far-eastern regions (Phalaborwa, Hoedspruit, Acornhoek and Kruger National Park) account for 4.8% of the total of polygraph examinations utilised;
- towns located in the southern regions (Mokopane, Marblehall, Lebowakgomo, and Zebediela) account for 4.6% of the total polygraph examinations utilised in Limpopo Province;
- the towns of Tzaneen, Letsitele and environs that are located to the east of Polokwane account 4.3% of the total of polygraph examinations utilised;
- the towns located in the far-south of Limpopo Province (Burgersfort, Steelpoort, Atok, Jane Furse and Groblersdal) account for 4.2% of the total polygraph examinations utilised in Limpopo Province;
- towns located in the south-western and far-western regions (Bela Bela and Thabazimbi) make up only 3.6% of the total polygraph examinations utilised in Limpopo Province. Interestingly, almost all of the polygraph examinations conducted in this region focused on the poaching of rhinoceros from game farms in the area and on the illegal trade in rhinoceros horn; and
- towns located in the far north-eastern regions (Giyani, Thohoyandou and Malamulele) account for 3.2% of the total polygraph examinations utilised in Limpopo Province.

4.2.3 Racial classification of examinees

The population of the Limpopo Province was estimated by Statistics South Africa in July 2010 to be 5 439 552 (StatsSA 2010: 1).

Black people made up over 97.3% of the population of Limpopo Province, followed by Whites (2.4%), Asian/Indians (0.2%) and Coloureds/people of mixed race (0.2%).

Of the one thousand examinees researched, 75.4% were local South African Blacks, 20.2% were Whites, 2.6% were Coloureds/people of mixed race, 1.1% were Asian/Indians and 0.7% were foreign non-South African Blacks: see Table 4.

Table 4: Racial classification of examinees

RACIAL CLASSIFICATION	Number	%
Black	754	75.4%
White	202	20.2%
Coloured/Mixed race	26	2.6%
Asian/Indian	11	1.1%
Foreign Black	7	0.7%
TOTAL	**1 000**	**100%**

When examined in more detail, the statistics indicate that 68.6% of the black examinees were tested for specific-issue or crime-related cases while 31.4% were tested for pre-employment, periodic or random screening purposes: see Table 4a.

Table 4a: Examination focus by racial group

RACIAL CLASSIFICATION	PRE-EMPLOYMENT/ PERIODIC SCREENING	SPECIFIC-ISSUE/ CRIME-RELATED CASES
Black (incl. foreign black) (761)	31.4%	68.6%
White (202)	44%	56%
Coloured/Mixed race (26)	46%	54%
Asian/Indians (11)	0%	100%
TOTAL AVERAGES (1 000)	**34.0%**	**66.0%**

In the case of white examinees, 56% were tested for specific-issue or crime-related cases while 44% were tested for pre-employment, periodic or random screening purposes.

In the case of Coloured or mixed-race examinees, 54% were tested for specific-issue or crime-related cases while 46% were tested for pre-employment, periodic or random screening purposes. In the case of Asian or Indian examinees, all (100%) were tested for specific-issue or crime-related cases while none were tested for pre-employment, periodic or random screening purposes.

From the above it is evident that white examinees make up a disproportionate number of the examinees analysed, in relation to their proportion of the larger population in the province.

4.2.4 Genders of examinees

An analysis of the research material revealed that males made up the overwhelming majority - 70.5% of the examinees tested while females made up only 29.5% of the examinees tested: see Table 5.

Table 5: Genders of examinees

GENDER RATIOS	Number	%
Male	705	70.5%
Female	295	29.5%
TOTAL	**1 000**	**100%**

When the general polygraph examination focus for the respective genders is examined in more detail, the statistics indicate that 63.4% of the males were tested for specific-issue or crime-related cases while 36.6% of them were tested for pre-employment, periodic or random screening purposes. In the case of the female examinees tested, 72.2% were tested for specific-issue or crime-related cases while only 21.7% of them were tested for pre-employment, periodic or random screening purposes: see Table 5a.

Table 5a: Examination focus by gender

GENDER	PRE-EMPLOYMENT/ PERIODIC SCREENING EXAMINATIONS	SPECIFIC-ISSUE/ CRIME-RELATED EXAMINATIONS
Males (705)	(258) 36.6%	(447) 63.4%
Females (295)	(82) 21.7%	(213) 72.2%
TOTAL AVERAGES (1 000)	**34.0%**	**66.0%**

The results above suggest that female examinees are tested proportionally more often than their male counterparts, for specific and crime-related issues in the Limpopo province.

4.2.5 Age groups of examinees

The ages of the examinees polygraph tested varied between eighteen years old and seventy years old: see Table 6.

Examinees from the age group 26 to 32 years represent the largest age group tested, namely 33.4% of the total, while the age group 33 to 39 years old represent the second largest number of examinees tested, namely 23.6%. The age group 19 to 25 years old represent the third largest group, with 21.0% of the examinees tested.

The number of the examinees older than 54 years of age represented a very small minority, a mere 3.6% of the total of examinees polygraph tested.

Table 6: Age groups of examinees

AGE GROUPS	Number	%
Younger than 18 years old	1	0.1%
19 to 25 years old	210	21.0%
26 to 32 years old	334	33.4%
33 to 39 years old	236	23.6%
40 to 46 years old	131	13.1%
47 to 53 years old	52	5.2%

54 to 60 years old	28	2.8%
62 to 70 years old	8	0.8%
Older than 70 years old	0	0%
TOTAL	**1 000**	**100%**

It is therefore very likely that in approximately 68% of cases, an examinee reporting for a polygraph examination will be between the ages of 19 and 39 years of age.

4.2.6 Prior exposure of examinees to polygraph testing

The vast majority, namely 84.1% of the examinees tested had not previously undergone any polygraph testing: see Table 7.

Table 7: Prior exposure of examinees to polygraph testing

PRIOR EXPOSURE TO POLYGRAPHY	Number	%
First examination	841	84.1%
Second examination	141	14.1%
Third examination	10	1.0%
Forth examination	7	0.7%
Fifth examination or more	1	0.1%
TOTAL	**1 000**	**100%**

Only 14.1% of the examinees tested had been subjected to a polygraph examination more than once, while only 1.8% of the examinees had undergone more than two polygraph examinations in the past.

These statistics indicate that the vast majority of examinees will be ‘first-timers’ and it is therefore very important that the procedures and various stages of the polygraph examination be explained to them in detail, to avoid any misunderstanding during the polygraph testing procedure and to ensure that accurate, objective and useful findings are reached.

4.2.7 Marital status of examinees

The marital status of the examinees polygraph tested were very evenly spread between single individuals who had never previously married and those who were formally married or who had undergone a customary marriage: see Table 8.

Table 8: Marital status of examinees

MARITAL STATUS GROUPS	Number	%
Single/Never married	452	45.2%
Married (Formal and Customary)	423	42.3%
Co-habiting	95	9.5%
Divorced	25	2.5%
Widow or Widower	5	0.5%
TOTAL	**1 000**	**100%**

Approximately 45.2% of the examinees polygraph tested were single individuals who had never previously been married, while 42.3% were formally married or had undergone a customary marriage.

The balance of the examinees polygraph tested were living in a co-habiting relationship with a partner (9.5%), were divorced (2.5%) or were living alone after losing a spouse.

When the marital status of the examinees tested were evaluated in more detail, it was found that 48.5% of the males were single or never married, while 51.5% of them were married, had previously been married or were cohabitated with a partner: see Table 8a.

Table 8a: Marital status and gender comparisons of the examinees

GENDER	SINGLE/NEVER MARRIED	MARRIED & PREVIOUSLY (FORMAL& CUSTOMARY) & CO-HABITATING
Males (705)	(299) 48.5%	(406) 51.5%
Females (295)	(153) 59.3%	(142) 40.7%
TOTAL (1 000)	**45.2%**	**54.8%**

When comparing the marital status of female examinees in more detail, it was found that 59.3% of the females were single or had never married, while 40.7% were married, had been married or were cohabitated with a partner.

4.2.8 Children of the examinees

The majority (40%) of examinees polygraph tested did not have any children or minor dependants in their care. This finding correlates quite favourably with the 452 unmarried examinees tested: see Table 9.

Table 9: Children of the examinees

CHILDREN NUMBERS	Number	%
No children	400	40.0%
One child	171	17.1%
Two children	198	19.8%
Three children	130	13.0%
Four children	56	5.6%
Five children	27	2.7%
Six children	10	1.0%
Seven children	5	0.5%
More than seven children	3	0.3%
TOTAL	**1 000**	**100%**

Some 17.1% of examinees had one child in their care while only 19.8% had two children in their care. A mere 13.0% of examinees had three child in their care while only 10.1% of the examinees polygraph tested had four or more children or minor dependants in their care.

On average therefore, approximately 60% of examinees polygraph tested will be responsible for one or more child. This is an important factor for employers to consider when such an individual is facing disciplinary procedures in the workplace or could be dismissed from a job or position for dishonesty.

4.2.9 Educational and academic levels of examinees

The majority (43.2%) of the examinees polygraph tested had passed and attained a Grade 12 senior school matriculation certificate: see Table 10.

Table 10: Educational and academic levels of examinees

EDUCATIONAL AND ACADEMIC LEVELS	Number	%
No education to Grade 2	23	2.3%
Grade 3 to 7 (Standard 1 to 5)	48	4.8%
Grade 8 to 10 (Standard 6 to 8)	127	12.7%
Grade 11 (Standard 9)	180	18.0%
Grade 12 (Matriculation/Standard 10/Form 5)	432	43.2%
National one-year certificate or equivalent	69	6.9%
National two-year diploma or equivalent	93	9.3%
Bachelors degree or equivalent	25	2.5%
Honours degree	3	0.3%
Masters degree or higher	0	0%
TOTAL	**1 000**	**100%**

Over 18% of the examinees polygraph tested had completed eleven years of schooling while 12.7% had completed between eight and ten years of schooling. Some 9.3% of the examinees polygraph tested had completed a post-matriculation qualification spanning two years of study (diploma) while 6.9% had completed a post-matriculation qualification spanning one year of study (certificate).

Only 2.8% of the examinees polygraph tested had completed an academic Bachelors degree or an Honours degree.

7.1% of the examinees tested had completed very little formal schooling and were therefore functionally illiterate or semi-illiterate:

- 2.3% had no schooling to two years of schooling; and
- 4.8% had completed three to seven years of basic education.

From a polygraph testing point-of-view these statistics are important because they suggest that in over 90% of cases an examinee will be sufficiently educated and literate to understand the polygraph procedures and questions that are put to them during a polygraph examination.

When the number of single female examinees who had never married (153) were compared to the number of children they had borne out of wedlock as well as the minimum educational levels they had attained, some interesting findings emerged: see Table 10a.

Table 10a: Educational level and number of children of single examinees

NUMBER OF CHILDREN					
Number of children	Number of children in different grades				
	None - Gr 7	Gr 8 -10	Gr 11	Gr 12	Post Matric
None (62)	0	4	1	39	18
One child (55)	0	3	10	18	24
Two children (22)	0	1	5	11	5
Three or more (14)	2	1	4	4	3
TOTAL (153)	**2**	**9**	**20**	**72**	**54**

It was found that 59.5% of the single unmarried female examinees tested had borne one or more children out of wedlock and that 28.6% of them had not attained a senior school matriculation certificate.

4.2.10 Occupational status and economic activity of examinees

The occupational status and economic activities of the examinees polygraph tested were found to be very varied and represented most of the major industries and career-groups in the Limpopo Province: see Table 11.

Examinees employed in industries and businesses that handled consumable goods, most notably staple foods and those who handled or transported cash – local or foreign currency and banking instruments such as credit cards, petrol cards, debit cards and cheque books were very well represented throughout. These findings suggest that examinee's in these industries

may be more inclined to commit crime in the work-place because they are exposed to goods that are much sought after, have high consumer value and could easily be disposed of on the black-market.

Examinees working in the generally unskilled labour occupational groups, including general assistants who were employed in a wide variety of industries, housekeeping staff and as cleaning staff, made up the largest percentage (17.5%) of examinees analysed.

These examinees did not come into regular and direct contact with customers or the public as part of their job, but they did have constant access to the products that most often go missing in the workplace. They form part of the lowest income bracket in the social hierarchy and most often earn only a minimum wage. They enjoy very little other fringe benefits in the workplace, generally live on the breadline and eek out a meagre living.

Examinees employed in the semi-skilled labour occupational groups that include shop cashiers, bank tellers, bank marshals, ATM custodians and any other businesses engaged in the handling of cash consignments and bulk cash services represented the second largest group (14%) subjected to polygraph testing. These examinees did come into regular and direct contact with customers and the public as part of their job and did have constant access to the products that often went missing in the workplace. They are part of the lower to middle income bracket in the social hierarchy, earn a fairly good living wage and enjoy some valuable fringe benefits in the work-place. They generally live above the breadline and can experience a good life-style.

Table 11: Occupational status and economic activity of examinees

OCCUPATIONS AND ECONOMIC ACTIVITY	Number	%
General assistants, housekeeping and cleaning staff	175	17.5%
Cashiers, bank tellers & marshals, ATM and bulk cash handling businesses	140	14.0%
Sales representatives, merchandisers, marketing personnel and petrol attendants.	96	9.6%
Security guards	68	6.8%

Unskilled labour, farm labour and gardeners	65	6.5%
Junior managers and supervisors	62	6.2%
Administrative-clerks, secretaries, receptionists & human resource practitioners (non-graduate)	62	6.2%
Drivers, heavy machine operators & forklift drivers	61	6.1%
Courier staff-drivers, assistants, checkers	57	5.7%
Security cash-in-transit and cash payment services	53	5.3%
General and IT technicians	42	4.2%
Stock controllers, checkers, receivers and dispatch	35	3.5%
Middle managers and supervisors	34	3.4%
Accountants, auditors, bookkeepers and credit control	24	2.4%
Trades, artisans and mechanics	11	1.1%
Technical operational support & call centres	5	0.5%
Armed response	4	0.4%
Senior managers and supervisors	3	0.3%
Mining industry	2	0.2%
Other	1	0.1%
TOTAL	**1 000**	**100%**

The third largest occupational group also represented a semi-skilled labour force that dealt most often with the sale and distribution of the various products in question and include sales representatives, merchandisers, marketing personnel and petrol attendants. This group came into regular and direct contact with customers and the public as part of their job and did have quite regular access to the products that were often found to have gone missing in the workplace. They are also part of the lowest income bracket in the social hierarchy, earn a slightly better living wage than those on the lowest levels but do enjoy some fringe benefits in the workplace. They generally live slightly above the breadline and can experience a modest life-style.

Approximately 94% of examinees polygraph tested came from the lower to middle income-brackets and unskilled to semi-skilled occupations, blue-collar workers and artisans, so to speak. Very few examinees, approximately 6% only, came from the upper-middle income skilled occupations or academic and professional categories, namely the middle managers

and supervisors, the senior managers, accountants, auditors, bookkeepers and credit controllers.

4.2.11 Criminal record or prior exposure to the criminal justice system

The overwhelming majority of examinees polygraph tested – 93.2% indicated during the pre-test interview that they had never had any criminal exposure to, or interaction with the South African criminal justice system, where they were the accused or charged person in question: see Table 12.

These examinees insisted that they did not have any criminal record, had never been charged with any offence or crime and that they had never been arrested in the past.

Table 12: Criminal record or prior exposure to the criminal justice system

CRIMINAL RECORD OR PRIOR EXPOSURE TO THE CRIMINAL JUSTICE SYSTEM	Number	**%**
No	932	93.2%
Yes	68	6.8%
TOTAL	**1 000**	**100%**

Some 6.8% of the examinees polygraph tested did indicate during the pre-test interview that they had been convicted of a crime, that they had a criminal record, that they had been charged with a crime or that they had been arrested at least once as a result of some interaction with the criminal justice system.

4.2.12 Language used during the polygraph examinations

The population of Limpopo consists of several ethnic groups, the Northern Sotho (Sepedi) make up 57%, the Tsonga (Shangaan) make up 23% while the Venda make up 12%. Afrikaans speakers make up 2.6% while English-speaking whites represent only a half percent (Limpopoinfo 2010: 1).

The vast majority of the examinees polygraph tested, 73.4%, requested that their polygraph examinations be conducted in the English language: see Table 13.

Table 13: Language used during the polygraph examinations

LANGUAGE USED DURING THE POLYGRAPH EXAMINATION	Number	**%**
English	734	73.4%
Afrikaans	246	24.6%
Northern Sotho (Sepedi)	20	2.0%
Other	0	0%
TOTAL	**1 000**	**100%**

This finding is very interesting, considering that only a half percent of the province's population list their first language as English (Limpopoinfo 2010: 1).

Approximately 24.6% of the examinees tested did request that their polygraph examinations be conducted in Afrikaans, while a mere 2% of examinees were polygraph tested using the Northern-Sotho (Sepedi) language. This occurred only when the examinee was unable to communicate in English or Afrikaans. Fortunately, the researcher is sufficiently fluent in Sepedi and was able to conduct these polygraph examinations successfully without the assistance of an interpreter.

From the above, it is evident that any polygraphist operating in the Limpopo Province should be fluent in English and Afrikaans, while fluency in Sepedi will be a distinct advantage, to avoid using an interpreter.

4.3 GENERAL PURPOSE OF THE POLYGRAPH EXAMINATIONS

Two-thirds (66%) of the examinees polygraph tested were tested for the purposes of clarifying specific issues in dispute or to investigate crime-related matters: see Table 14.

Table 14: General purpose of the polygraph examinations

GENERAL PURPOSE OF POLYGRAPH EXAMINATION	Number	**%**
Crime-related and specific-issue polygraph examinations	660	66.0%
Pre-employment screening and security vetting polygraph examinations	224	22.4%
Periodic or random screening and security vetting polygraph examinations	116	11.6%
TOTAL	**1 000**	**100%**

Only 22.4% of the examinees polygraph tested were subjected to pre-employment screening polygraph examinations for the purposes of clarifying their honesty, integrity and security competence prior to being considered for employment. The balance of those polygraph tested (11.6%), had undergone periodic or random screening polygraph examinations, in order to confirm that they are still maintaining the level of honesty, integrity and security competence required by their respective employers or the positions they occupied.

4.3.1 Specific focus of the polygraph examinations

The following priority areas and subjects of specific focus emerge from the polygraph examinations conducted: see Table 15.

As previously mentioned, approximately 66% of the polygraph examinations conducted focused on crime-related or specific-issue cases. Generally, the specific focus of the various polygraph examinations conducted mirror the various priority industries and economic sectors identified, and reflect the primary occupational groups and economic activities of the examinee polygraph tested.

Table 15: Specific focus of the polygraph examinations

SPECIFIC FOCUS OF POLYGRAPH EXAMINATION	Number	**%**
Honesty, integrity and security competence of examinee	290	29.0%
Theft of cash and large sums of money	228	22.8%
Theft of general company stock, deliveries and property	161	16.1%
Theft of electronic items, power tools and cellular phones	112	11.2%
Theft of rhino horn and protected plant species	35	3.5%
Financial crimes – credit card skimming and banking fraud	30	3.0%
Theft of bulk foods, maize meal, flour and other grains	27	2.7%
Theft of petrol, diesel and motor oils	19	1.9%
Theft of gas and gas cylinders	19	1.9%
Theft of bulk liquor products and soft drinks	16	1.6%
Verify version of truth, events, or issues	15	1.5%
Collaboration in cash-in-transit and armed robberies	12	1.2%
Theft of copper, ferrous and non-ferrous metals	8	0.8%
Theft of domestic/farm animals and stock	8	0.8%
Arson	6	0.6%
Assault or acts of violence	5	0.5%
Damage to company or private property	4	0.4%
Racism or racial abuse	3	0.3%
Sexual harassment	2	0.2%
TOTAL	**1 000**	**100%**

Some 29% of the examinees polygraph tested were subjected to polygraph testing for the purposes of clarifying their honesty, integrity and security competence prior to being considered for employment and to verify that they maintain the required level of honesty, integrity and security competence to secure their continued employment.

Some 22.8% of the polygraph examinations conducted were for the purposes of investigating the theft of cash and large sums of money from private enterprises, banking institutions and other businesses handling or transporting money.

Following this, 16.1% of the polygraph examinations conducted were for the purposes of investigating the theft of general company stock, of missing deliveries and the theft of private property, while 11.2% focusing on the theft of electronic items, power tools and cellular phones in particular. If taken together, then these two categories of company and private property theft make up over 27.3% of the polygraph examinations conducted.

Six broad focus groups emerge from the research, namely the theft of non-consumable products, the verification of examinees' honesty and integrity, the theft of cash/money, the theft of consumable products, inter-personal conflict and damage to property: see Table 16.

The non-consumable products identified all have high consumption value and give good returns to the thieves on the black-market because they can be disposed of easily and quickly. This also applies to the consumable products identified.

In three cases, it was found that unscrupulous businesses in the food industry had purchased stolen goods and recycled or redistributed them as their own. The theft of very large amounts of diesel or petrol, of copper or non-ferrous metals and the theft of large loads of maize meal, serve as three examples of this occurring (Grobler, 2010; Adonis, 2010 & Van der Walt, 2010)

The fact that these products can be disposed of so easily on the black-market raises many questions about the morality and honesty of the average man on the street. The public are often quite prepared to purchase these goods, knowing that they are most probably stolen. The ability of the police to combat these illegal activities and to bring not only the perpetrators of the original crime to book, but also those who purchase this stolen property is very limited, if honest citizens do not report such activities in their communities.

The fact that more and more companies are using pre-employment polygraph testing to screen prospective employees prior to recruitment, is indicative of their awareness that dishonest individuals and active criminals must be prevented from entering the work-place, if internal theft in particular and crime in general is to be minimised in the work-place (Thomas, 2010).

Table 16: Broad focus groups of the polygraph examinations

BROAD FOCUS GROUPS	Number	%
Non-consumable products: Theft of general company stock, deliveries and private property Theft of electronic items, power tools and cellular phones Theft of petrol, diesel and motor oils Theft of gas and gas cylinders Theft of copper, ferrous and non-ferrous metals	319	31.9%
Verification of examinees' honesty and integrity: Honesty, integrity and security competence of examinee	290	29.0%
Theft of cash/money: Theft of cash and large sums of money Financial crimes – credit card skimming and banking fraud Collaboration in cash-in-transit and armed robberies	270	27.0%
Theft of consumable products: Theft of bulk foods, maize meal, flour and other grains Theft of bulk liquor products and soft drinks Theft of domestic/farm animals and stock Theft of rhino horn or protected plant and animal products	86	8.6%
Inter-personal conflict: Assault or acts of violence Verify version of truth, events, or issues in dispute Racism or racial abuse Sexual harassment	25	2.5%
Damage to property: Arson Malicious damage to company or private property	10	1.0%
TOTAL	**1 000**	**100%**

4.4 FINANCIAL LOSS INCURRED BY THE CLIENT PER EVENT

The largest range of financial or monetary loss (24%) incurred by clients using polygraph examinations as an investigative tool was between R6000 and R10 999 per event: see Table 17. The second largest range (11.6%) of monetary loss incurred by clients was between R11 000 and R25 999 and represented all industries and clients using polygraph testing. This category was followed by the range, R1001 to R5 999 that accounted for 10.1% of the total.

From the above it is clear that in approximately 35.6% of cases analysed the financial or monetary losses incurred by the clients concerned was less that R11 000. While such amounts are on the face of it not large in monetary terms, the very negative economic effect that two or three consecutive thefts of say R10 000 could have on a small company becomes very significant and could result in such a company going out of business.

Table 17: Financial loss incurred by the client per event

FINANCIAL LOSS INCURRED BY THE CLIENT	Number	**%**
Not applicable (pre-employment & other screening examinations)	330	33.0%
No loss incurred	20	2.0%
Less than R1 000	15	1.5%
R1 001 to R5 999	101	10.1%
R6 000 to R10 999	240	24.0%
R11 000 to R25 999	116	11.6%
R26 000 to R50 999	49	4.9%
R51 000 to R75 999	5	0.5%
R76 000 to R100 999	16	1.6%
R101 000 to R200 999	66	6.6%
R201 000 to R400 999	10	1.0%
R401 000 to R600 999	8	0.8%
R601 000 to R800 999	0	0.0%
R801 000 to R1 million	10	1.0%
More than R1 million	0	0%
Loss unknown or unable to determine	14	1.4%
TOTAL	**1 000**	**100%**

The findings above also emphasises the importance of securing even the smallest amounts of cash held in a company's office, in the cash till or in the petty-cash tin, of a small company. The fourth largest range of R101 000 to R200 000 accounted for only 6.6% of the total but in monetary terms represented huge losses because they are incurred most often by financial institutions where large amounts of cash are handled or businesses where very valuable assets had been stolen. Unfortunately, these businesses have to rely heavily on high-risk short-term insurance policies to ensure that stolen assets and funds are replaced quickly.

The soft-drink industry and liquor trade were often found to suffer large financial losses due to the theft of large consignments and from those companies who handled bulk cash amounts or large cash-ups (Thomas, 2010; Van Wyk, 2010).

The largest range (33%) accounted for those examinees tested for pre-employment and periodic/random screening polygraph examinations purposes.

4.5 SPECIFIC QUESTION FORMAT USED FOR THE POLYGRAPH EXAMINATIONS

The choice of which specific question format to use when conducting a polygraph examination is determined primarily by the following factors:

- what the general purpose is of the examination, namely whether the examination is intended to investigate a crime-related matter or resolve a specific-issue in dispute or whether the focus is to verify the honesty and integrity of an examinee by conducting a pre-employment screening/security vetting process or a periodic/random screening/ security vetting process;

- the complexity of the issue under investigation, what needs to be resolved and the number of examination questions that would logically be required on the polygraph examination to cover all the elements of the issue in dispute;

- the intellectual capacity and linguistic abilities of the examinee; and

- the personal preferences of the polygraphist (Jennings & Slupski 1997: 2(1)2).

Table 18 represents the question formats used by the researcher to conduct the polygraph examinations examined for this study:

Table 18: Specific question format used for the polygraph examinations

SPECIFIC QUESTION FORMAT USED	Number	**%**
Four-question US Air force – modified general question technique (4Q-USAF MGQT)	489	48.9%
Vetting question test (VQT) (using five relevant questions)	290	29.0%
Zone comparison test (ZCT)	112	11.2%
Three-question US Air force modified general question technique (3Q-USAF MGQT)	71	7.1%
Five-question US Air force modified general question technique (5Q-USAF MGQT)	18	1.8%
Two-question US Air force modified general question technique (2Q-USAF MGQT)	11	1.1%
Modified general question technique	6	0.6%
USAF MGQT - confirmatory test	3	0.3%
TOTAL	**1 000**	**100%**

In cases where the purpose of the polygraph examination was to investigate a crime-related matter or to resolve a specific-issue in dispute, the 'four-question-US Air Force modified general question technique' (4Q-USAF MGQT) was used in the vast majority of cases, namely 67.6%.

In 11.2% of cases, use was made of the 'zone comparison test' (ZCT) question format, representing 15.5% of the crime-related matters investigated or specific-issues in dispute resolved. In 7.1% of all cases, the 'three-question-US Air force modified general question technique' (3Q-USAF MGQT) question format was used. Both of these question formats offer three relevant questions in the polygraph examination.

In cases where the purpose was to conduct a pre-employment screening or a periodic/random screening, the 'vetting question test' (VQT) question format was utilised almost exclusively,

representing 29% of the total of polygraph examinations done. The VQT offers five relevant questions in the polygraph examination.

All the test question formats listed in Table 18 above fall within the category 'control/ comparison question techniques' (CQT). These formats allow the polygraphist to compare the examinee's responses to each relevant question with the examinee's responses to the control/comparison questions immediately adjacent to each relevant question, and so develop a numerical score for the polygraph test (Matte 1996: 686).

4.6 RESULT OR FINDING OF THE POLYGRAPH EXAMINATIONS

Polygraph examinations conducted for the purposes of pre-employment screening can produce one of four outcomes as indicated in Table 19 below, namely:

- No deception indicated (NDI):
  - the NDI outcome suggests that the polygraphist has concluded that the examinee answered all the relevant questions truthfully and has therefore passed the polygraph examination (Jennings & Slupski 1997: 1(1)11).

  - usually the examinee's appointment will then be recommended because it appears that the examinee has met the minimum standards of honesty and integrity required by the client. Sometimes however, a polygraphist may not recommend the examinee for employment because they are of a professional opinion that the examinee will not be a good investment or a long-term asset to the client. These opinions may be based on something that the client may have overlooked or some information that the polygraphist gleaned during the polygraph examination; but

  - the final decision however will obviously always remain with the client.

- Deception indicated (DI):
  - the DI outcome suggests that the polygraphist has concluded that the examinee did not answer one or more of the relevant questions truthfully and has therefore failed the polygraph examination; and

- the examinee's appointment to the position envisaged will most often then not be recommended because it appears that the examinee has not met the minimum standards of honesty and integrity required by the client (Jennings & Slupski 1997: 1(1)6).

- Inconclusive (INC):
  - an INC outcome suggests that the polygraphist was not able to reach a specific conclusion as to whether the examinee had answered all the relevant questions truthfully or not, based on the examination conducted; and

  - the polygraphist will usually conduct a second examination if time allows or recommend a re-test at a later date to clarify the matter. Alternatively, the polygraphist may give the examinee the benefit of the doubt, depending on the degree to which the examinee has displayed deceptive or non-deceptive responses on the examination, and after taking all the facts surrounding the investigation into consideration (Jennings & Slupski 1997: 1(1)9).

- No opinion (NO):
  - a NO outcome is given only on rare occasions when the polygraph examination could not be completed due to circumstances beyond the polygraphist's control, and
  - the polygraph examination will usually be rescheduled to a later date or different venue, if the circumstances allow (Jennings & Slupski 1997: 1(1)12).

Table 19: Polygraph examination findings: pre-employment screening polygraph examinations

POLYGRAPHIST'S FINDING	TOTAL NUMBER OF EXAMINATIONS	% OF TOTAL
No deception indicated (NDI)	**179**	**80%**
Deception indicated (DI)	**18**	**8%**
Inconclusive (INC) finding	**27**	**12%**
No opinion (NO) finding	**0**	**0%**
TOTAL	**224**	**100%**

In the case of the 224 examinees polygraph tested for pre-employment screening or for security vetting purposes above:

- 80% of the examinees had passed the polygraph examination with a NDI result;
- 8% had failed the polygraph examination with a DI result; and
- 12% had displayed inconclusive (INC) results.

From the client's point of view, these findings suggest that the polygraph testing criteria and the standards applied when evaluating job applicants are quite realistic and not too stringent. It would not be realistic or cost-effective for any employer to submit say ten job applicants for polygraph testing, and then have half of them turned away for being unsuitable. Ideally, a polygraph screening examination should be conducted in the final stage of the employment recruitment process, when a short-list of ideal candidates has been compiled. The findings above also suggest that most of the clients included in this study appear to conduct some degree of screening prior to requesting that the examinee undergo the polygraph screening examination.

In the case of the 116 examinees polygraph tested for periodic or random integrity screening or for security vetting purposes:

- 78% of them had passed the polygraph examination with a NDI result;
- 6% had failed the polygraph examination with a DI result; and
- 16% had displayed inconclusive (INC) results: see Table 19a.

Table 19a: Polygraph examination findings: periodic or random screening periodic polygraph examinations

POLYGRAPHIST'S FINDING	TOTAL NUMBER OF EXAMINATIONS	% OF TOTAL
No deception indicated (NDI)	**91**	**78%**
Deception indicated (DI)	**6**	**6%**
Inconclusive (INC) finding	**19**	**16%**
No opinion (NO) finding	**0**	**0%**
TOTAL	**116**	**100%**

These findings suggest that the vast majority (78%) of employees concerned managed to maintain a good level of honesty and integrity in the workplace while approximately 22% have deviated from these standards or engaged in activities that compromise their honesty and integrity.

These findings may serve as a confirmation that periodic or random integrity screening polygraph examinations do effectively deter employees from engaging in crime in the workplace, because examinees know that they will be scrutinised and evaluated in the future.

In the case of the 660 examinees polygraph tested to investigate crime-related matters or to resolve specific-issues in dispute:

- 70% of them had passed the polygraph examination with a NDI result while 20% had failed the polygraph examination with a DI result; and
- 10% had displayed inconclusive (INC) results: see Table 19b.

Table 19b: Polygraph examination findings: crime-related or specific-issue polygraph examinations

POLYGRAPHIST'S FINDING	TOTAL NUMBER OF EXAMINATIONS	% OF TOTAL
No deception indicated (NDI)	**463**	**70%**
Deception indicated (DI)	**133**	**20%**
Inconclusive (INC) finding	**64**	**10%**
No opinion (NO) finding	**0**	**0%**
TOTAL	**660**	**100%**

These findings unequivocally endorse the positive approach that the polygraph industry has been advocating for many years, namely that polygraphy focuses on 'truth verification' rather than on 'lie detection'. The findings above do confirm that many more 'innocent' examinees are tested, in order to flush out the 'guilty' individuals.

4.7 CLIENT'S RESPONSE TO THE RESULTS OF POLYGRAPH EXAMINATIONS

In the case of the 224 examinees polygraph tested for pre-employment screening or security vetting purposes:

- 87% of them were recruited for employment by the client who had requested the polygraph examinations; and
- the balance, 13% were not recruited by the client: see Table 20.

When examined in more detail, 98% of the examinees who had passed their polygraph screening with a NDI result were subsequently employed by the client while 94% of the examinees who had failed their polygraph screening with a DI result, were not subsequently employed by the client. The findings above tend to confirm the importance and weight that employers attach to the outcome of these pre-employment screening polygraph examinations and the recommendations made by the polygraphist. Some 67% of the examinees who had produced an inconclusive (INC) result were evidently given the benefit of the doubt and offered employed by the client while the balance of 33% were not.

Table 20: Client's response to the results of polygraph examinations: pre-employment screening polygraph examinations

POLYGRAPHIST'S FINDING	TOTAL NUMBER OF EXAMINATIONS	RECRUITED BY CLIENT	NOT RECRUITED
No deception indicated (NDI)	**179 (80%)**	176 (98%)	3 (2%)
Deception indicated (DI)	**18 (8%)**	1 (6%)	17 (94%)
Inconclusive (INC) finding	**27 (12%)**	18 (67%)	9 (33%)
No opinion (NO) findings	**0 (0%)**	0 (0%)	0 (0%)
TOTAL	**224 (100%)**	**194 (87%)**	**30 (13%)**

In the case of the 116 examinees polygraph tested for periodic or random integrity screening or security vetting purposes, 97.5% of those were retained as employees by the client who had requested the polygraph examinations while the balance of 2.5% were not retained as employers: see Table 20a.

When examined in more detail, 100% of the examinees who had passed their polygraph screening with a NDI result were retained as employees by the client.

Some 50% of the examinees who had failed their polygraph screening with a DI result, were retained as employees while the balance were not retained as employees by the client.

All of the examinees who had produced an inconclusive (INC) result, were evidently given the benefit of the doubt and retained as employees by the client.

Table 20a: Client's response to the results of polygraph examinations: periodic or random screening periodic polygraph examinations

POLYGRAPHIST'S FINDING	TOTAL NUMBER OF EXAMINATIONS	CONTINUED EMPLOYMENT	RESIGNED/ DISMISSED
No deception indicated (NDI)	**91 (78%)**	91 (100%)	0 (0%)
Deception indicated (DI)	**6 (6%)**	3 (50%)	3 (50%)
Inconclusive (INC) finding	**19 (16%)**	19 (100%)	0 (0%)
No opinion (NO) reached	**0 (0%)**	0 (0%)	0 (0%)
TOTAL	**116 (100%)**	**113 (97.5%)**	**3 (2.5%)**

The findings appear to suggest that employers generally use these polygraph findings very objectively as a management tool, to identify possible personnel problems and to close loop-

holes in their administrative and security procedures that could be exploited by criminally-inclined employees.

In the case of the 660 examinees polygraph tested to investigate crime-related matters or to resolve specific-issues in dispute, 70% of the examinees passed their polygraph examinations by displayed NDI results. Some 20% of the examinees failed their polygraph examinations by displaying DI results and 10% of the examinees displayed INC results with no conclusive outcome: see Table 20b.

When examined in more detail, 96.8% of the examinees who had passed their crime-related or specific-issue polygraph examination with a NDI result did not have any further action taken against them by the client and were deemed to have been exonerated of any wrongdoing or any direct or indirect involvement in the issue under investigation.

Table 20b: Client's response to the results of polygraph examinations: crime-related or specific-issue polygraph examinations

POLYGRAPHIST'S FINDING	TOTAL EXAMINATIONS DONE	NO ACTION/ EXONER-ATED	REPRIMAND/ FINAL WARNING	RESIGNED	DISMISSED
No deception Indicated (NDI)	**463 (70%)**	448 (96.8%)	11 (2.4%)	3 (0.6%)	1 (0.2%)
Deception indicated (DI)	**133 (20%)**	12 (9.0%)	48 (36.1%)	9 (6.8%)	64 (48.1%)
Inconclusive (INC) finding	**64 (10%)**	25 (39.1%)	24 (37.5%)	2 (3.1%)	13 (20.3%)
No opinion (NO) reached	**0 (0%)**	0 (0%)	0 (0%)	0 (0%)	0 (0%)
TOTAL	**660 (100%)**	**485 (73.5%)**	**83 (12.6%)**	**14 (2.1%)**	**78 (11.8%)**

As mentioned above, the findings above again confirm the importance and weight that employers attach to the outcome of these crime-related or specific-issue polygraph examinations and the findings made by the polygraphist.

The balance (2.6%) of those who had passed their crime-related or specific-issue polygraph examination with a NDI result did have some form of disciplinary action taken against them by the client because, they were deemed to have been negligent or careless to some degree, or had contributed in some negative way to the issue under investigation or the crime. Approximately 0.6% of the NDI result examinees subsequently resigned soon after the events.

When examined in more detail, 48.1% of the examinees who had failed their polygraph examinations by displaying a DI result, were subsequently dismissed by the client. A further 36.1% had some form of disciplinary action taken against them by the client because they were deemed to have been indirectly or directly involved, negligent or careless to some degree, or to have contributed in some negative way to the issue under investigation or the crime.

Some 9% of these examinees were evidently given the benefit of the doubt by he employer and no further action was taken against them, while 6.8% of the DI result examinees subsequently resigned.

When the examinees who had displayed INC results to the crime-related or specific-issues under investigation were examined in more detail, it emerged that 20.3% of these examinees were subsequently dismissed by the client.

A further 37.5% had some form of disciplinary action taken against them by the client because they were deemed to have been directly or indirectly involved, negligent or careless to some degree, or had contributed in some negative way to the in the issue under investigation.

Some 39.1% were evidently given the benefit of the doubt and no further action was taken against them, while 3.1% of the INC result examinees subsequently resigned.

The findings above again seem to confirm earlier observations that employers use the outcomes of the polygraph examinations very objectively and employ them as a useful management tool to deal with problems of crime, conflict and dishonesty in the workplace.

4.8 FOLLOW-UP RESEARCH AND COLLECTION OF ADDITIONAL INFORMATION FROM CLIENTS

4.8.1 Introduction

The post-test information was collected from clients who had instituted some form of disciplinary sanction against examinees, who had been linked to dishonesty or criminal acts against the employer, colleagues or any clients. The findings revealed the trends discussed below.

4.8.2 Final outcome: disciplinary hearings

In the case of the 660 examinees polygraph tested to investigate crime-related matters or to resolve specific-issues in dispute, 133 of the examinees failed their polygraph examinations by displaying DI results and 64 of the examinees displayed INC results with no conclusive outcome.

A total of 132 disciplinary hearings were held by various clients to deal with these incidents, resulting in the dismissal of 78 examinees, the formal reprimand of 83 examinees and the eventual resignation of 14 examinees: see Table 21.

Table 21: Disciplinary hearings and final outcomes

NUMBER OF DISCIPLINARY HEARINGS	DISMISSALS	FORMAL REPRIMANDS	RESIGN-AT-IONS
132	78	83	14

These findings seem to confirm that the polygraph examination results do make some positive contribution towards resolving cases under investigation and can add sufficient evidentiary weight to the other circumstantial evidence presented, to guarantee a successful disciplinary outcome against dishonest employees.

4.8.3 Final outcome: CCMA hearings

In the case of the 78 examinees dismissed by the respective clients, 20 cases were referred to the Commission for Conciliation, Mediation and Arbitration (CCMA) for further conciliation, mediation or arbitration: see Table 22.

Table 22: CCMA cases and final outcomes

NUMBER OF CCMA DISPUTES	DISMISSAL CONFIRMED	OVERTURNED /RE-INSTATED	PENDING
20	12	5	3

These findings indicate that 60% of cases that referred to the CCMA, where polygraph testing played a role in identifying the examinee as a criminal perpetrator or playing a role in a criminal incident under investigation, produced a successful or positive outcome for the employer and only 25% were overturned for unspecified reasons.

4.8.4 Final outcome: criminal charges

In the case of the 78 examinees dismissed by the respective clients, only 22 criminal charges were laid against these examinees by the client at the SAPS.

Unfortunately, these findings reflect a larger problem plaguing the entire Limpopo province. The vast majority of clients served by the researcher have expressed frustration with the lack of efficiency from the SAPS in particular and the judiciary in general. As this research has shown, the vast majority of cases investigated polygraphists in the Limpopo Province relate to internal theft of stock and money. The SAPS are unfortunately often unwilling or unable to conduct proper investigations into these cases and businesses are left to their own resources to solve the crime or to identify the perpetrators.

Many of the clients consulted for this research feel that the chances of recovering any goods or money stolen in most cases, was slim.

4.8.5 Appearance by polygraphist (researcher) at disciplinary hearings and CCMA cases

In only four cases, two disciplinary hearing and two CCMA cases was the researcher called to be available as an expert witness for the employer against the examinee.

In the first disciplinary hearing, held by a financial house in Jane Furse (Vermeulen, 2010) the researcher was required to testify by telephone conferencing and to explain the polygraph examination finding in detail. The evidence was heard and entered into the hearing records for consideration by the presiding officer. The examinee was found guilt of theft and fraud and subsequently dismissed.

In the second disciplinary hearing, held by a courier company in Polokwane (Pretorius, 2010) the researcher was called to attend the hearings as an expert witness but was not called into the proceedings to testify. The polygraph examination findings formed part of the corroborating evidence submitted by the employer against the examinee and the cases were concluded in favour of the employer/client. The examinee was found guilty of theft and given a final warning.

In both CCMA hearings, the first by a furniture outlet in Thohoyandou (Lesch, 2010) and the second by a domestic interior company in Polokwane the researcher was called to attend the hearings as an expert witness. In both cases, the polygraph examination findings concerned formed part of the corroborating evidence submitted by the employer against the examinees and in both cases the polygraph examination findings were not challenged by the accused examinees. As a result, both cases were concluded in favour of the employer, without the researcher being called to testify. All the examinees who appeared were found guilty of theft and in both cases all were dismissed.

Chapter 5
RESEARCH FINDINGS

5.1 HISTORICAL PERSPECTIVE

The polygraph industry has enjoyed a permanent presence in the Limpopo Province since 2000. Currently only the researcher and Snyman operate a permanent polygraph testing service in Limpopo Province.

Sufficient scope does exist for the polygraph industry to grow substantially in the Limpopo Province. The two companies currently operating there must attempt to corner the market and ensure that companies and businesses in the province only use local polygraph companies, rather than bringing polygraph companies up from Gauteng to service their needs.

Some important aspects need to developed further, in order to ensure the sustainability of this industry in the Limpopo Province:

5.2 SUMMARY OF FINDINGS ON THE OPERATIONAL ANALYSIS AND COMPARISON OF POLYGRAPH EXAMINATIONS

5.2.1 Introduction

Operational information that has emanated from the analysis of the coded data could prove very useful to security managers, criminologists and loss control managers seeking a better understanding of the utilisation of polygraphy as a crime-prevention instrument and an investigation tool in the Limpopo Province.

5.2.2 Companies and clients using polygraphy most frequently

The research has identified which industries and companies utilise polygraph testing most frequently and what the purpose was for using polygraph testing. It has determined which cities or towns and geographical areas utilise polygraphy most frequently, as well as the nature and extend of the problems or crimes that these industries and companies attempt to resolve with the aid of polygraphy. The unique polygraph testing needs of the various economic sectors, private businesses and industries operating in the province will be better understood and the economic sectors, businesses and industries most at risk from criminal activity or dishonesty in the workplace will be known. This includes an understanding of the

industries and companies most often targeted by dishonest employees, the products most frequently stolen and the scale of financial losses incurred by these clients.

Finally, the role of pre-employment and periodic or random polygraph- screening as a crime-prevention instrument or part of a personnel-screening process and the role of crime-related and specific-issue polygraph testing to deal with crime in the workplace or with other issues in dispute, will be better understood. From the perspective of the clients, businesses and industries using polygraph testing for pre-employment and crime-related/specific-issue testing purposes was found to be prolific and widespread throughout the Limpopo province, but specifically in the larger commercial centres in Polokwane, Louis Trichardt/Makhado and Tzaneen. Polokwane, including its surrounding industrial areas, the Seshego industrial area, the Polokwane central business district and the immediate rural and farming areas that fall under the Polokwane municipality, accounted for 67.5% of the polygraph examinations analysed.

Industries dealing with staple foods and consumable products, handling or transporting money and businesses dealing with portable luxury and electronic goods that could easily be disposed of, made use of polygraph testing most often to investigate internal theft in the workplace. It was therefore not surprising to find that the abovementioned industries also made use of pre-employment and periodic polygraph screening most often to prevent crime and expose crime in the workplace.

5.2.3 The profile of examinees that underwent polygraph examinations

Concerning the profile of examinees tested, they ranged between the ages of 19 and 39 years old made up over 78% of the examinees tested. Interestingly, over 84.1% of the examinees tested had never previously undergone any polygraph testing beforehand. The examinees generally reflected the racial make up of the Limpopo Province, however more Whites and less local South African Blacks were represented proportionately in the research group. The analysis also indicated that 70% of the examinees were men but this was probably because men were generally more economically active in the job-market. From a crime perspective however, further research needs to be conducted to make any determination on its significance. The marital status of examinees were very evenly spread between single individuals who had never previously married and had no children, and those who were in a

formal or customary marriage with children. Approximately 43.2% of the examinees polygraph tested had passed and attained a Grade 12 senior school matriculation certificate.

The occupational status and economic activities of the examinees were found to be very varied and represented most of the major industries in Limpopo province. Some 94% of the examinees tested came from the lower to middle-income bracket and unskilled to semi-skilled occupations, namely blue-collar workers and artisans so to speak.

The overwhelming majority of examinees tested (93.2%) indicated that they had never had any prior criminal exposure to, or interaction with the criminal justice system (CJS), in situations where they were the suspect, accused or charged person in question. The vast majority of the examinees tested (73.4%) requested that their polygraph examinations be conducted in the English language while only two percent requested that their polygraph examinations be conducted in Northern Sotho (Sepedi), the primary ethnic language of the province.

5.2.4 The focus and type of polygraph examinations conducted

Concerning the focus of the examinations conducted, some 66% of the polygraph examinations conducted focussed on crime-related or specific-issue cases, while 22.4% focussed on pre-employment screening purposes and 11.6% focused on periodic or random screening. Examined in more detail, it emerged that 22.8% of the crime-related or specific-issue polygraph examinations explored the theft of money while 27.3% explored the theft of company stock, missing deliveries, private property, electronic items, power tools and cellular phones. Six broad focus areas emerged from the above, namely:

- the theft of non-consumable products;
- the verification of examinees honesty and integrity;
- the theft of money;
- the theft of consumable products;
- inter-personal conflict; and
- damage to property.

Criminals specifically targeted consumable and non-consumable products that had high value, could easily be disposed and could give the criminal a quick return when sold on the black-market because they were in high demand. All clients concerned suffered some form of financial or monetary loss. In 35.6% of cases the financial or monetary losses incurred per event was less that R11 000, but often these clients had been victims to a number of small thefts before resolving to investigate the matter thoroughly and to conduct polygraph examinations. The largest losses reported (24%) were between R6000 and R10 999 per event, followed by losses of between R11 000 and R25 999 per event (11.6%).

The polygraph examination procedures used most frequently, the USAF MGQT polygraph examination question format was utilised in over 74% of the crime-related and specific-issue cases investigated, while the VQT was used almost exclusively to conduct pre-employment and periodic/random screening polygraph examinations. An analysis of the polygraph examination findings and eventual outcomes revealed that 80% of the examinees polygraph tested for pre-employment screening or security-vetting purposes passed their polygraph examination, while eight percent failed and 12% displayed inconclusive results. In these cases, most of the examinees that had passed, were recruited, while an average of half of those who had displayed inconclusive results, were also recruited.

In the case of examinees polygraph tested for periodic or random integrity screening or security vetting purposes, 78% of them passed the polygraph examination while six percent failed and 16% displayed inconclusive results. All the examinees that had passed, were retained while most of those who had displayed inconclusive results, were eventually dismissed or retrenched.

In the case of the examinees polygraph tested to investigate crime-related matters or to resolve a specific-issues in dispute, almost 70% had passed their polygraph examinations while 20% had failed and 10% displayed inconclusive results. Most of the examinees that had passed were retained and no further action was taken against them, but almost half of those who had failed, were eventually dismissed or retrenched. The balance of the examinees who had failed, were subjected to a disciplinary hearing, given a final warning or reprimanded.

The follow-up interviews conducted with clients confirmed that pre-employment and periodic/random polygraph examinations were very effective screening tools that deterred

those individuals who were predisposed to crime and dishonesty from gaining access to vulnerable work environments and identified and exposed criminals active in the workplace.

The deterrent factor that periodic and random polygraph testing played within the work environment could not be underestimated and was borne out by the reduction in the levels of internal theft at companies who had adopted this strategy to reduce stock losses.
The findings also confirmed that crime-related and specific-issue polygraph examinations played a positive and constructive role in directing internal investigations and providing corroborating and/or circumstantial polygraph evidence that assisted management and disciplinary committees to adjudicate and conclude disciplinary hearings objectively and fairly.

5.2.5 Operational challenges and obstacles encountered

A number of operational obstacles encountered by polygraphists in Limpopo province, were identified and discussed, especially the practical difficulties and conservative attitudes encountered in some industries and at some testing venues. These included the lack of ideal polygraph testing facilities, very male-orientated environments and unsafe road networks.

The findings suggest that the existing polygraph testing industry in the Limpopo Province offers good potential for further development and expansion but it would be importance to dispel uninformed opinions and myths concerning the legal use of polygraph testing and market its important role in preventing and investigating crime in the workplace or for resolving issues in dispute.

5.3 IMPLICATIONS FOR CRIME-PREVENTION IN THE WORKPLACE

This research findings suggest that continued use of pre-employment polygraph screening procedures will play a significant role in keeping criminals and persons with criminal intentions from gaining employment in a business.

These crime-prevention procedures (pre-employment and periodic screening procedures) will partially ensure that all new employees are honest, trustworthy and do have the skills and qualifications reflected in their documentation and curriculum vitae.

When polygraph examinations are used as part of a company's pre-employment screening or vetting process, employers are much more likely to determine when a job applicant has:

- previously stolen money, stock or equipment from any previous employer;
- been suspended, removed from any position or dismissed from any previous employer for theft or dishonesty;
- assisted other people to steal from their previous employers;
- stolen the property of colleagues, customers or suppliers;
- included false information on their curriculum vitae or job application;
- submitted false qualifications or certificates and driving licences;
- committed serious crimes or previously been arrested;
- committed any as yet-undetected crimes;
- undeclared financial problems or excessive debts;
- a chronic gambling habit;
- is a chronic abusers of alcohol, medication or unlawful drugs; and
- displayed psychological or mental illness that may be detrimental to their job or position.

As illustrated in these research findings (Geldenhuys, 2010; Adonis, 2010) these polygraph screening procedures do have a very positive effect on maintaining a good level of honesty and integrity in the workplace. From a cost-effectiveness point of view, it is obviously advisable that pre-employment polygraph examinations are conducted just prior to the final recruitment, when all other screening and selection processes have been completed.

Routine or periodic/random screening polygraph examinations conducted by employers will usually expose an employee who:

- deliberately causes the business financial, deliberate harm or asset loss;
- commits crimes against the company, its staff or its clients;
- commits crimes outside the work-place; and
- does not maintain a level of honesty and integrity that is expected by the company or required by the position they occupy.

The research findings show that the process of routinely polygraph testing staff varies from industry to industry (see Tables 15&16) and depends very much on the product being produced, transported or handled, the size of workforce involved, the risks that the company are vulnerable to, the extent of losses incurred and other security procedures in place.

A policy advocating a bi-annual or annual ad hoc, unscheduled random polygraph examination screening for staff in high-risk positions or businesses in a high-risk crime environment or industry is very effective at exposing crime, and serves as a very good deterrent to any employer contemplating dishonesty or a criminal act. In order to reap the most benefit from these procedures, the following aspects must be kept in mind when conducting these examinations:

- the polygraph testing should be very focussed and goal-directed, and support other crime-prevention and security measures already in place;
- the focus should be on key personnel, includes those who have special access to valuable company assets or information, who occupy very sensitive positions in the company and those who could cause the business very serious economic and physical harm; and
- all managers, stock controllers, security staff, IT system controllers and financial officers for example, would fall into this category.

The research findings confirm that some businesses that face a constant risk of industrial espionage from competitors, because of the very competitive nature of their industries, have adopted screening procedures that include polygraph testing to expose industrial espionage. The cellular telephone and vehicle tracking industries serve as two very good examples in this regard.

These polygraph testing procedures are designed to identify industrial espionage attempts, to protect very sensitive information, trade secrets, patents, client lists, pricing policies and company interests, and to expose disloyal employees. In some very competitive industries, this sensitive information could prove very useful and could give the competition or opposition a competitive edge. Apart from a ‘whistle-blower’ system or a long, drawn-out and expensive covert investigation, the only other cost-effective tool that could expose

individuals engaged in industrial espionage against a business on behalf of a competitor, is polygraph testing.

5.4 IMPLICATIONS FOR CRIME INVESTIGATION IN THE WORKPLACE

Two-thirds of the polygraph examinations conducted during the period researched were for the purposes of investigating crime-related matters or resolving specific issues in dispute.

This statistic underlines the important role that polygraphy continues to play as an investigative tool. A clear unambiguous polygraph examination finding/outcome can:

- quickly narrow down the number of possible suspects in an investigation;
- can quickly eliminate innocent suspects and verify their alibis;
- give new impetus to an investigation that has reached a dead-end or lacking in direction;
- expose new suspects or focus on specific suspects;
- provide corroborating evidence to support other information or evidence already available or known in an investigation;
- add probative weight to other circumstantial evidence or information already known and lean the balance of probability towards a suspect;
- help a company manager to resolve a crime problem or minimise a risk in the work-place that is threatening the safety of the business or other staff members; and
- help a presiding officer in a disciplinary hearing or dispute to make a proper and correct decision, based on the circumstantial and corroborating evidence that a polygraph examination result has clarified or re-enforced.

5.5 COUNTERMEASURES TO INFLUENCE EXAMINATION OUTCOMES

Jennings (Jennings & Slupski 1997: 1(1)5), the former chief-instructor of the AIIP defines countermeasures as any deliberate actions that are taken during a polygraph examination, to manipulate the eventual outcome of a polygraph examination. Jennings stated that these measures could include chemical, mental or physical manipulation. Polygraphists are trained to identify any attempt by the examinees to deliberately manipulate the outcome of a polygraph examination they are undergoing. These actions could include subtle physical movements or flinches of the body, self-inflicted pain or the consumption of specific

medications that might influence or suppress the psycho-physiological reactions of the examinee (Matte 1996: 532-3).

The research findings in the Limpopo Province showed that examinees only rarely tried to manipulate results by using deliberate counter-measures. Sometimes, an examinee was observed moving a finger or a hand during the polygraph examination, most probably to 'test the system' but would stop when cautioned by the polygraphist. On some other occasions, an examinee would appear to deliberately cough or clear his throat soon after answering a question during the polygraph examination, but again would stop when cautioned by the researcher. In a few cases, an examinee would attempt to control their breathing, by not inhaling and exhaling normally, but by taking shorter breaths, but would usually stop when cautioned to breathe normally by the researcher.

While some of these actions could be construed as an attempt to manipulate the polygraph examination, in most cases it was viewed by the researcher merely as an attempt by the examinee to manage his nervousness and to calm himself down.

In some regions of the Limpopo Province, the regular and daily abuse of the prohibited substance 'dagga' (Cannabis Sativa) (Drug Wars 2003: 1) was found to be quite common, as a cultural trait so to speak (Els, 2010). A number of the examinees included in this research admitted that they had used dagga prior to undergoing their polygraph examination, usually the night before, but in some cases within 2-3 hours of the polygraph examination being conducted. Most often, the examinees admitted to smoking dagga just before retiring for bed and/or early in the morning soon after rising for work. These examinations all produced suitable charts for evaluation and were not treated with suspicion, because the examinees had not attempted to conceal their use of the drug prior to the polygraph examination. Apart from the above, no other behaviour was observed that may suggest that a chemical or pharmaceutical counter-measure was used by any examinee, to manipulate any polygraph examination conducted.

According to the Axciton Pharmaceutical Directory (APD 2010: 1) designed and developed in conjunction with pharmaceutical and medical experts by the polygraph instrument manufacturer Axciton Instruments, dagga or cannabis has the following effects on polygraph examination results:

- the examinee may seem very relaxed and calm, but he may display withdrawal symptoms such as not being able to keep still or to concentrate;
- his pulse and blood pressure may be very consistent and display very little psychophysiological distress, but he could display withdrawal symptoms such as an erratic heart rate or panic attacks, and
- the examinee may appear very calm, but he could display withdrawal symptoms of restlessness and irritability.

From the above, it is evident that no unique pattern of behaviour exists that can be taken as the norm when examinees are abusing dagga. The polygraphist should deal with each case on its own merits, based on what he is confronted with in the field.

5.6 DIFFICULTIES WITH SOME POLYGRAPH EXAMINATION VENUES

Ideally, a venue used to conduct polygraph examinations should conform to the following minimum requirements (in order of importance):

- a private room that can be shut off for the testing period;
- that will not be entered by other people during the testing period;
- is free of telephones or other similar audible equipment;
- has a desk of suitable size and two chairs without wheels;
- has suitable electricity plugs and overhead lighting;
- is not exposed to loud noises or external conversation;
- ventilated room with a temperature of 22 to 24 degrees Celsius; and
- clean, dry and fresh (Jennings & Slupski 1997: 4(1)1-7).

Sometimes the polygraph testing venues provided by clients were not entirely suitable or equipped for polygraph testing and an alternative had to be found at the insistence of the researcher. In most cases, the circumstances could be remedied by moving to an alternative venue in the area or by renting a hotel room or guest-house room for the purpose. In some cases however, the researcher simply had to make the best of the unsuitable circumstances because no alternatives were available. On such occasions, it was made very clear to the client prior to the examination that the examinee would enjoy the benefit of the doubt, should

the researcher feel that the outcome had been negatively influenced by any external factors or by the unsuitable testing conditions.

5.6.1 Hot climatic conditions

Some areas in the Limpopo Province experience very hot and humid climatic conditions during the summer months and sometimes the examination venues provided were not equipped with air-conditioning or adequate ventilation. Usually a alternative venue was found, but sometimes the researcher simply had to make do with what was available. Fortunately, these conditions proved merely a discomfort to both the researcher and the examinee, rather than a factor that might have negatively influenced the examination outcomes.

5.6.2 Cold climatic conditions

Some areas in the Limpopo Province experience cold climatic conditions during winter and sometimes the examination venues provided were not adequately equipped with air-conditioning or suitable heating. As was the case above, sometimes no alternative venue was available, and the researched simply had to make do with what was available.

These conditions proved more of a challenge to the researcher and the examinee because of the negative effects that cold temperatures play on the electro-dermal/sweat-gland activity (galvanic skin responses) in particular and on the examinee's physiology in general. In these circumstances the examinee would often be clothed in a heavy garment to keep warm and it is logical that this could also probably affect the sensitivity and finer detail of the psychophysiological chart recordings collected.

5.6.3 Rural male-orientated conditions

Some parts of Limpopo Province are very rural in nature and the geographical distribution of the province is quite diverse, ranging from very dry sandy and rocky areas to very muddy, mountainous and overgrown terrain. Quite often the researcher is requested to enter these rugged rural environments to conduct polygraph examinations. Some of the rural roads serving these areas that no longer well maintained and often require not only a rugged vehicle (at least a 4x2 pick-up) but also good off-road driving and navigation skills to reach the client. Some of these locations are also very male-orientated in terms of the workforce, the facilities available and circumstances encountered. The mining and the construction industry

in particular, and some small communities where satellite banking facilities or rural basic foodstuff distribution depots are located, serve as good examples of such conditions (Grobler, 2010). When required to stay overnight to complete large numbers of polygraph examinations, the accommodation made available by the client is sometimes very basic in nature and the toilet facilities are quite often very 'rustic' or crude. A female polygraphist would undoubtedly find some of these situations very intimidating and experience a sense of physical vulnerability (Fourie, 2010).

It is therefore very important to take these adverse factors into consideration, when commissioning a polygraphist to undertake polygraph examinations in such remote rural settings.

5.7 POTENTIAL FOR EXPANSION OF THE POLYGRAPH TESTING INDUSTRY IN LIMPOPO PROVINCE

5.7.1 Local clients

The findings above indicate that the polygraph industry in Limpopo Province has huge potential for further development. Ongoing marketing and promotion of the profession will identify new clients and develop those already using polygraphy. Most importantly, it is vital that local clients be encouraged to utilise local polygraphists already operating in the province before they call upon polygraphists from further afield, such as Gauteng to attend to their needs in the province.

5.7.2 Foreign clients in close proximity to Limpopo Province

With the exception of Gys Du Preez of Polysure (Pty) Ltd in Pretoria, (Du Preez, 2010) few other polygraphist are known to focus exclusively on conducting polygraph outside South Africa. Du Preez has been conducting polygraph examinations in Angola for over fourteen years and more recently has expanded his business into Botswana, Namibia, Malawi, Zambia, Zimbabwe and Mozambique, primarily for the mining industry.

Any polygraph company located in Limpopo Province is therefore already ideally located to provide a polygraph testing service to clients in Botswana, Mozambique, Zimbabwe, Malawi or Zambia. The road links to these countries are generally good and well established, should road-travel be preferred. The Gateway Airport in Polokwane provides an air link with the OR

Tambo International Airport in Johannesburg, where flights are available to the capitals of all these countries (Gateway 2011: 1).

5.8 DISPELLING UNINFORMED OPINIONS CONCERNING THE USE OF POLYGRAPHY

Some uninformed views surround polygraphy in South Africa. These include the misconception that polygraph examination finding cannot be submitted as evidence in disciplinary hearings or other legal disputes, that polygraphist do not undergo any formal or internationally recognised training, and a general lack of understanding about its role as an investigation and personnel-screening tool. It is very important for the polygraph industry to make concerted efforts to dispel some of the inaccuracies and uninformed misconceptions about polygraph examinations and the utilisation of polygraph findings in disciplinary hearings, dismissal and legal procedures. This will ensure that any potential clients are well aware of the value and benefits of polygraph testing.

The following aspects of polygraph testing are important to consider:

- an examinee cannot be forced or coerced to undergo a polygraph examination:
    - contractually an examinee may be obliged to undergo a polygraph examination if requested by an employer in terms of a consensual agreement entered into beforehand;
    - the examinee is always at liberty to refuse but then he would be in breach of that agreement and could be charged with misconduct or breach of contract (Prinsloo 2007: 40); and
    - in a legal opinion published by Advocate Andre Bezuidenhout in 1998 (Bezuidenhout 1998: 71), he refers to the case of Harmse v Rainbow Chicken Farms (Pty) Ltd, the presiding officer in this CCMA case found that the employer had the right in circumstances of financial loss to exert pressure on its employees to co-operate in an investigation into misconduct or crime and to undergo polygraph examinations if required;
- an examinee must submit himself voluntarily and is at liberty to terminate the examination at any stage, if he so chooses;
- the examinee must give their full co-operation throughout the examination to ensure that reliable and useful charts are recorded for evaluation;

- if an examinee refuses to submit to a polygraph examination they should not automatically be presumed to have incriminated themselves or be guilty of the crime under investigation. An examinee who exercised his right to refuse is usually required to give some plausible or reasonable explanation for his decision to refuse;
- an examinee who is deemed to be mentally ill, emotionally distressed or physically unsuitable, for example, suffering pain, hunger, severe fatigue or the effects of alcohol, drugs, or post- traumatic stress are not suitable to be polygraph tested until these factors no longer apply; and
- polygraph examinations can be used as a pre-employment screening tool or an investigation tool, and the results can be submitted to any disciplinary hearing or legal proceedings in any South African court of law:
    - no legislation has ever been promulgated by parliament or any decision made by any court of law in South Africa prohibiting the use of polygraphy as a pre-employment screening or investigation tool;
    - no pronouncements have been made by any South African courts of law nor has any legal precedent been set concerning the admissibility of polygraph examination findings in any legal proceedings or dispute;
    - Advocate Andre Bezuidenhout (1998: 65) concluded that:

        > There is no prohibition against the admission into evidence of polygraph examinations whether at common law or in terms of any Statute. Neither the Civil Proceedings Act nor Chapter 24 of the Criminal Procedure Act nor the Labour Relations Act precludes its acceptance. In both of the former two statutes, however, irrelevant evidence is inadmissible;

    - to date no clarity has been given by any South African court of law, as to how such polygraph examination findings would be defined or categorised in law; and
    - no clarity has been given as to the probative value of polygraph findings or the evidentiary weight that polygraph findings should or would carry in a court of law (Prinsloo 2007: 39).
- polygraph examination can serve as very useful investigation tool and was never intended to provide irrefutable forensic evidence to the courts:
    - polygraph examinations are a very useful and effective tool to collect additional information on an issue and provide relevant, useful and accurate corroborating

evidence that will add probative value and weight to other circumstantial evidence already available (Prinsloo 2007: 39);

- suspects in a criminal case might eventually be found guilty beyond reasonable doubt and convicted on other evidence that was obtained with the aid of the polygraph examination results, rather than on the polygraph examination findings themselves;
- suspects in a civil case might eventually be found guilty on a balance of probabilities and convicted on other evidence that was obtained with the aid of the polygraph examination results, or where the polygraph examination findings themselves add additional probative value and corroborative weight to the other evidence already submitted (Prinsloo 2007: 39&54);
- therefore, no legal or technical reason exists to justify any prohibition of polygraph examination findings in any legal proceedings or to prevent the submission of polygraph examination results to corroborate other evidence already submitted, provided that the findings are relevant (Prinsloo 2007: 38-39 & 54);
- Bezuidenhout (1998: 10) concluded further that generally speaking, South African courts of law have been slow to recognise the evidential value of polygraph examination findings, however polygraph examination findings continue to be submitted very frequently during disciplinary hearings, to corroborate other evidence and to assist presiding officers in such matters to reach an accurate and fair decision;
- in the CCMA case of Van Schalkwyk v National Trading and Co (2000) 21 ILJ 2323 (CCMA) it was concluded that the polygraph test results submitted supported the corroborating evidence already led and lent further weight to the inference that the applicant was guilty as charged (Bezuidenhout 1998: 10);
- over the past fifteen years, polygraph examination findings have been submitted and accepted as corroborating evidence to support other evidence or testimony in some CCMA and Industrial Court cases but Bezuidenhout (1998: 10) acknowledges that some CCMA Commissioners are not always familiar with its role and value and have been reluctant to accept polygraph examination findings into evidence; and
- polygraph examination findings and the expert witnesses presenting them will always be subjected to the usual legal rules and technical scrutiny of the Court, in

terms of the Laws of Evidence and Criminal/Civil Procedure, as is the case with any other evidence presented in the Courts.

- polygraph testing complies with the South African Constitution and all Labour Legislation:
  - proper polygraph testing procedures comply in every respect with the South African Constitution and all Labour legislation;
  - ethical polygraph testing procedures promote fair labour practices, respect for human rights and the privacy of the examinee;
  - polygraph testing also affords the innocent suspect an opportunity to be heard and to prove their innocence; and
  - the polygraph profession's code of ethics and procedures prescribe that examinees should be treated in a dignified and respectful manner, and that no irrelevant or intrusive questions that may violate their dignity or rights to privacy, should be put to them at any time. (Prinsloo 2007: 77).

5.9 Summary

A well-qualified, properly trained and experienced polygraphist will provide an efficient, ethical and professional polygraph service and deliver accurate, useful results.

An effective polygraph examination can provide the client with an outcome almost immediately, and it is an excellent investigative tool that not only saves time and money, but also saves investigation man-hours.

Chapter 6
RECOMMENDATIONS AND CONCLUSION

6.1 RECOMMENDATIONS

The following aspects need to be addressed in order to ensure that the South African polygraph industry remains competitive and professional:

6.1.1 Regulation of the South African polygraph industry

As discussed above, in 1999 an attempt was made to institute statutory regulations on the South African polygraph industry, but was not successful. This process needs to be revived by the polygraph industry as soon as possible, so that they can make constructive submissions to an appropriate body to conclude the process. It is the opinion of this researcher that statutory regulation should focus on three areas, namely enforcing training standards, requiring annual statutory registration and enforcing ethical and operational standards:

Firstly, it is essential to ensure that each polygraphist entering the local polygraph industry is trained to meet international standards. As explained above, APA entry requirements and an APA-accredited course is currently regarded as the minimum requirement to qualify as a polygraphist and register with any of the local polygraph associations. Some aspects of the APA-accredited courses and practises are however no longer appropriate to Southern African conditions and need to be changed to suit local conditions – see paragraph 6.3 below for details in this regard. The first aim of statutory regulation of the industry should therefore be to ensure that inexperienced and unqualified individuals are unable to operate in the local polygraph industry.

Secondly, it is essential to establish and maintain a national register of qualified polygraphists operating in South Africa. Any unregistered polygraphist will then be subject to legal sanction by an appropriate statutory body, if they conduct polygraph examinations unlawfully. Ideally, the polygraph industry should fall under the auspices of PSIRA, given its activities and the statutory role that PSIRA plays vis-à-vis the private security industry. Unfortunately, PSIRA is currently not operating optimally, but when these problems are resolved then PSIRA should be able to fulfil this role.

Thirdly, polygraphists must be required to conform to statutory regulations that specify and emphasise good ethical and operational procedures and practises. Polygraphists who repeatedly fail to conform to these regulations would then be deregistered and prohibited from conducting polygraph examinations in the country. A channel and mechanism to receive, investigate and to adjudicate complaints would also need to be established, to give effect to the above.

6.1.2 Consolidation of the South African polygraph fraternity

As described above, currently the overwhelming majority of local polygraphists are represented by two autonomous polygraph associations. In order to address the statutory regulation process properly and to deal with the challenges of tomorrow, it is very important that the local polygraph industry unite under one association, so that it can speak with one voice and adopt a common unified approach to important issues in the industry. It is unfortunately a fact that some historical animosity does exist between the two associations, and the issues that brought about the split in the industry and the establishment of SAPPA in the first place, need to be addressed and resolved comprehensively.

In order to give effect to the above, it is therefore essential that the unification process started by Van Rooyen and others in 2010, be continued and that the two associations be consolidated as soon as possible.

6.1.3 Indigenisation of polygraph practise and training in South Africa

A number of clauses in the current APA constitution (see Annexure F) are not entirely appropriate to the circumstances and realities faced by polygraphists operating in Southern Africa. It is therefore essential that the local polygraph industry draft an appropriate constitution that is unique to Southern Africa and meets the needs and character of the local polygraph industry. A number of aspects that require attention in the view of this researcher are listed below:

- paragraph 3.2.1 to 3.2.3 distinguishes between an ‘evidentiary examination’, ‘paired-testing’ and an ‘investigative examination’. It is the researcher’s opinion that all ‘investigative examinations’ whether conducted to investigate a crime or to resolve any specific-issue in dispute, should always meet the highest ethical and operating standards and be able to withstand any judicial scrutiny and peer review. It is essential

that the highest standards are consistently applied, whether or not the findings are eventually used in a disciplinary hearing, submitted at the CCMA or presented in a court of law, and that all polygraph examination findings are as credible, accurate and reliable as possible. The administrative and documenting procedures that a polygraphist may follow to ensure that various types of records are stored for later utilisation may vary, but ethical and operating procedures should never;

- paragraph 3.3.4 requires that practising polygraphists 'shall complete a minimum of 30 continuing education hours every two years in coursework related to the field of polygraphy'. In the USA seminars are offered on different aspects of polygraphy quite regularly by state polygraph associations, and annually the APA presents an international seminar over six days that offers an extensive programme of lectures, demonstrations and exhibits on all aspects of polygraphy (APA 2011: 34-40). It is very difficult and expensive for any South African polygraphists to attend these conferences and seminars and to satisfy the APA's requirements for specific continued education. While the bi-monthly 'APA Magazine' and quarterly journal 'Polygraph' do provide the local polygraphists with the latest trends and ongoing research findings in the international polygraph fraternity, this does not satisfy the continued education requirements. The local polygraph fraternity therefore needs to find a mechanism to ensure that all polygraphists in the industry remain abreast of the latest developments and research in the broader international fraternity;

- paragraph 3.5.1.4 states that a motion sensor or activity monitor will be required as a fifth recording component for all polygraph instruments with effect from 1 January 2012. Currently the majority of polygraphists in South Africa still use polygraph instruments that use four recording components. The implication of this ruling is that a large number of local polygraphists will be required to upgrade or replace their existing polygraph instruments, at very significant expense. Most of the older model polygraph instruments cannot accommodate the motion sensor or activity monitor and would have to be replaced, at a cost ranging from approximately R35 000.00 to R56 000.00 (US$5 000.00 to US$ 8 000.00) per instrument. The local polygraph fraternity will need to address these issues and consider alternatives to the proposals;

- paragraph 3.9.2 states that an ‘acquaintance test’ must be conducted for all evidentiary and sexual-offender examinations and is recommended for all specific issue or investigative examinations. An acquaintance test requires that the examinee deliberately lie to the polygraphist and the questions asked of him during the test. It has been the experience of the researcher and confirmed by a number of local polygraphists that local examinees are loathe to lie during the acquaintance test, after being told that they should be completely truthful, if they wish to pass the main polygraph examination. The acquaintance test is approached with suspicion by many examinees and is not therefore not serving its intended purpose. Consequently, many local polygraphists have abandoned the conventional acquaintance test in favour of a more detailed explanation and graphic demonstration of how the polygraph instrument collects polygraph charts and how the polygraphist reaches a finding. This approach appears to have the desired effect and seems to be replacing the acquaintance test in many instances. This issue needs to be researched and a new approach unique to Southern Africa needs to developed and implemented;

- paragraph 3.9.9 states that polygraphists must make an audio/video recording of the pre-test and in-test phase of each polygraph examination conducted, and retain it as part of the examinee’s records. Given the volume of polygraph examinations conducted by many polygraphists in South Africa and the fact that most examinations are conducted at the client’s location, this requirement is totally impractical and unattainable. Collecting these audio/video recording not only takes time, but serve no purpose unless they are reviewed in detail afterwards, something few private polygraphists ever have time for. The researcher is of the opinion that this requirement be discarded but could be used by government employed polygraphists engaged in counter-intelligence or counter-espionage investigations and have the facilities to record the entire examination and the time to review and evaluate such recordings;

- paragraph 4.3.1 states that a polygraphist is prohibited from conducting more than four investigative or three evidentiary examinations in one day, and no more than five examinations of any type in one day. On rare occasion, exigent circumstances may warrant a waiver of this requirement; and

- paragraph 4.7.2 states that all polygraph records and documentation related to a polygraph examination should be retained for at least one year. It is the opinion of the researcher that all examinations records relating to investigation-type and specific-issue examinations that produce a DI result, should be retained for at least three years in case they are required in a disciplinary or legal dispute. Polygraph examination records conducted for pre-employment and periodic screening purposes also prove very useful, when the examinee is again required to undergo a polygraph examination at a later date. These records should also be retained for at least three years because they assist the polygraphist to develop a long-term profile of the examinee's honesty and integrity.

6.1.4 The importance of maintaining professional standards

The by-laws of the APA (see Annexure F) and local polygraph associations (SAPPA 2010a: 1-20) emphasise the importance of maintaining good ethical and professional standards in the polygraph profession. It is therefore also very importance that good levels of honesty, integrity and ethical behaviour be upheld by all polygraphists operating in South Africa, to ensure that the integrity and professionalism of the industry is upheld. Polygraphists themselves must ensure that:

- all polygraph examinations are conducted in a professional and ethical manner that will withstand any ethical or legal scrutiny, or any peer-review;
- that they will contribute fairly and constructively to reducing the number of dishonest individuals entering the work-place;
- that they will quickly and effectively expose criminals in the work-place; and
- that they will quickly help to identify criminals in our society and help bring them to book.

It remains the client's/employer's moral and legal responsibility to ensure that they only utilise polygraphists that conform to the minimum standards advocated by the South African polygraph industry:

- the polygraphist has completed and passed an internationally accredited polygraph course at an accredited polygraph institution;
- has at least five years of investigative experience;
- have a criminology, police science or related tertiary qualification;

- use a modern computerised polygraph equipment;
- use recognised question formats and polygraph procedures;
- is a member of the APA, the world-leaders and trendsetters for the international polygraph profession;
- is also a member of a the local polygraph association; and
- preferably is a member of one or more local security or criminological institution such as South African Institute of Security (SAIS) or Criminological Association of South Africa (CRIMSA) (Van Rooyen, 2011; By-laws of the APA (see Annexure F); SAPPA 2010a: 1-20).

6.1.5 Further research on this topic

As discussed above, a number of post-graduate students and academics in the fields of labour law in particular have published very useful research articles and academic papers addressing the role and status of polygraphy within the context of South African law. Some of these researchers are quoted in this research study. However, the activities of the South African polygraph industry and role that polygraph testing plays in preventing crime and as an investigation tool in South Africa has not received any extensive research.

In 2010, Friedo Herbig, an associate professor in Criminology at the University of South Africa published a article that advocated the use of polygraphy as a criminological support mechanism or tool within the criminal justice, criminology and victimology environment (Herbig 2010: 78-97). This was the first academic article outside the realm of Labour Law to address some operational aspects concerning polygraphy and to discuss the role of polygraphy within the correctional services context in particular. Herbig, who has completed a basic polygraph examiners course but has never conducted polygraph examinations professionally, made a strong argument for the use of polygraphy as an investigative tool within correctional institutions in particular. He advocated the use of polygraphy to verify the honesty of parole applicants and to investigate the activities of inmates in certain matters. Herbig also envisaged a role for polygraphy as a monitoring mechanism to evaluate awaiting trial prisoners and monitor the behaviour of parolees. Herbig does not however address the issue of ‘voluntary consent’ in his article. Ethical polygraphy requires the polygraphist to obtain the examinee’s voluntary consent and collaboration to undergo a successful polygraph examination. It is very unlikely that such collaboration would be voluntary within a

correctional institution setting and begs the question, whether an inmate would be penalised if he refused to undergo a polygraph examination for whatever reason, or not. A parolee obviously has vested interests in collaborating with the correctional services and to meet their parole conditions, in order to be released, but a serving inmate will in all likelihood need to be 'encouraged' to cooperate with a polygraphist in exchange for some form of benefit or privilege.

Polygraphy is very versatile, but it is most effective as an investigative tool where specific issues are in dispute, and much less effective where broad, vague or ambiguous issues are being monitored. Further research is required to investigate new areas within the criminal justice, criminology and victimology environment where polygraphy can be used effectively, bearing in mind its limitations.

The sky is the limit in as far as further research on the field of polygraphy in South Africa is concerned. There are however certain issues that should to take precedent, because they could contribute to a better understanding of the role and function polygraphy as a whole, namely:

- to what degree pre-employment polygraph examinations contribute to preventing crime in the workplace;
- to what degree random or periodic screening polygraph examinations contribute to identifying criminals active in the workplace;
- to what degree crime-related polygraph examinations contribute to combating crime, exposing dishonest employees, to securing the dismissal of such employees and to subsequent criminal convictions;
- polygraph training, relevant investigation skills and the appropriate academic qualifications for South African polygraphists;
- the evidentiary role and the probative value that polygraph examination results can play in criminal and civil legal proceedings in South Africa, and
- a comprehensive examination of the entire polygraph industry in South Africa.

6.2 CONCLUSION

The study explored the historical roots of the South African polygraph industry in the private and public sector and gave the reader some unique insight into the circumstances that led the

NIS/NIA, MID, SAPS and SASS to establish their own polygraph testing units. It also examined the local private polygraph industry as it operates today and considered various issues, such as the consolidation of the existing associations into one representative body and the legislative status of polygraph findings in disciplinary hearings and the CCMA.

The study examined the nature and scope of polygraph training currently offered in South Africa and emphasised the need to indigenise training and the local polygraph industry, to meet the unique testing conditions that confront polygraphists in South Africa and the needs of local clients. A number of recommendations were made concerning the need for statutory regulation of all polygraphist operating in the country industry and APA policies that need to be reviewed, to further the indigenisation of polygraph training and raise professional standards in the local polygraph industry. The study also exposed the lack of academic research emanating from the polygraph industry itself and underlined the need for further research on the operational aspects and utilisation of polygraphy in South Africa,

The case study on Limpopo Province provided a new and detailed insight into the operational application and utilisation of polygraphy in that region, because no similar study has previously been conducted on this topic in South Africa. The study examined and defined the unique circumstances and challenges encountered by polygraphists serving the province, the demands made by clients, the distribution and nature of the demand and the crimes and issues in dispute that require most attention. It also examined and defined the type of examinees that undergo polygraph testing, whether for crime-prevention and personnel screening purposes, or when they are the subject of an investigation or issue in dispute.

The study will prove very useful to any polygraphists contemplating relocating to the Limpopo Province or wanting to provide a polygraph service in that region. They will now be aware what the nature, scope and potential are for developing a profitable polygraph testing service in the province. For those polygraphists already serving the province, the study will help them to redirect or sharpen their testing efforts and provide a more professional and focussed polygraph testing service.

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ANNEXURES

ANNEXURE A: Polygraph examination interview questionnaire

POLYGRAPH EXAMINATION INTERVIEW QUESTIONNAIRE			
Client	**(a) CLIENT/INDUSTRY/BUSINESS**	For attention	
Telephone		Email	
Physical Address	**(b) AREA/LOCATION OF EVENTS/ EXAMINATION**	Return km	

Examinee's Name	**(c) RACE (e) AGE**	**(d) GENDER**	M		F	

ID number/DoB							X					X				**EXAM REF.**	- 2010

Previously tested	Y		N		When last	**(f) DATE OF THIS EXAM**	Reason for examination	
Revett- this exam	First		Second		Third		Outcome	

PRE-EXAMINATION CONSENT			
I agree to undergo a polygraph examination for the following purpose/regarding the following matter:	**(m) ISSUE UNDER INVESTIGATION/PURPOSE OF EXAMINATION (n) SPECIFIC FOCUS (o) VALUE OF LOSS/DAMAGE**		
I have not been threatened with dismissal, promised anything or forced to undergo this examination. I undertake to co-operate fully with the polygraphist throughout the examination.	Signed by examinee	/ / 2010 **DATE**	

PRE-TEST INTERVIEW: MENTAL AND PHYSICAL SUITABILITY					
	Particulars/Details				Medication taken
Mental health					
Emotional stress					
Physical health		Head injury	Y	N	
Pain or cramps					
Respiratory		Smoker	Y	N	
Heart/cardio					
Current illness		Epilepsy	Y	N	
Drug abuse					
Alcohol use					

Fatigue		No. of hours slept	
Pregnancy		Ate in last 12 hrs	

PRE-TEST INTERVIEW: PERSONAL PARTICULARS											
MARITAL STATUS (g)	Single		Married		Divorced		Widow/widower		Co-habit		
Highest qualification **(i)**				**(h) NO. OF CHILDREN**							
Period	Employer, Unit, Location, Place			Position/duties			Reason for leaving				
	(j) OCCUPATION/JOB &			**POSITION**							

PRE-TEST INTERVIEW: JUDICIAL HISTORY/CRIMINAL & DISCIPLINARY RECORD			
Have legal or disciplinary proceedings ever been brought against you, or are any pending? If yes, see below.		Yes	No
When	Charge/Indictment	Court verdict/Sentence/Conclusion	
		(k) CRIMINAL HISTORY	

PRE-TEST INTERVIEW: CASE FACTS AND QUESTION REVIEW
(l) LANGUAGE
IN-TEST NOTES
POST-TEST INTERVIEW NOTES
NON VERBAL COMMUNICATION: ATTITUDE:
FORENSIC INTERVIEW ASSESSMENT:
Axciton White Algorithm:
Axciton Chart Algorithm:
Examiner Hand Score:
COMMENTS:
(r) INTERNAL OUTCOME **(s) IF DISCIPLINARY HEARING HELD**
(t) IF CCMA HEARING HELD **(u) IF CRIMINAL CHARGES LAID**
(v) EVENTUAL CONCLUSION/POST-EXAMINATION CONFIRMATION (AFTER INTERVIEWING SELECTED CLIENT, USING THE QUESTIONNAIRE BELOW (Annexure C)
CONCLUSION/FINDING:

SCORE SHEET						
EXAM FORMAT	**(P) EXAMINATION FORMAT USED**					
CHART I	R1	R2	R3	R4	R5	R6
Pneumograph						
Galvanograph						
Cardiograph						
SPOT SCORE						
CHART II	R	R	R	R	R	R
Pneumograph						
Galvanograph						
Cardiograph						
SPOT SCORE						
CHART III	R	R	R	R	R	R
Pneumograph						
Galvanograph						
Cardiograph						
SPOT SCORE						
SPOT TOTAL						
GRAND TOTAL			**FINDING**	**RESULT/ FINDING (Q)**		

POST-EXAMINATION CONFIRMATION

I confirm that all the questions asked during the polygraph exam were first reviewed with me beforehand, that I understood each question asked and that I have no complaints as to how the polygraph examination was conducted.	Signature

ANNEXURE B: Data table with data codes

#	(a) Industry of client	(b) Area of events	(c) race	(d) gender	(e) age	(f) This examination	(g) Marital status	(h) Child-ren	(i) Educational level	(j) Occupation/ position/ job	(k) Criminal Record	(l) Examination language	(m) General issue
1	Wholesale Food /supermarkets	Polokwane central	Black	M	<18	1st	Sing	0	0-Gr2	Security Guard	No	English	Pre-employment Vetting
2	Courier	Polokwane Industrial	White	F	19-25	2nd	Marr	1	Gr3-7	Security CIT Custodians	Yes	Afrikaans	Periodic Screening
3	Electronic	Polokwane rural	Indian/ Asian		26-32	3rd	Divorce	2	Gr8-10	Cashier/ Teller/ bank marshal ATM, Bulk /CIT		Northern Sotho	Investigation
4	Security CIT/ Cash payments	Louis Trichardt/ Dzanani	Coloured		33-39	4th	Cohabit	3	Gr11	Technician / IT		Zulu	
5	Security Guard	Mokopane	Foreign W		40-46	5th	Widow	4	Gr12	All Labourers/ Gardeners		Interpreter	
6	Financial/ Banks	Phalaborwa	Foreign B		47-53	> 5		5	12+1	General asst/ Housekeep/			
7	Hospitality / fast food /Entertainment	Tzaneen	Foreign other		54-60			6	12+2	Junior Manager/ Supervisor			
8	Farming	Musina			61-70			7	Degree	Driver/ Operator/ fork –lifter/ Yellow			
9	Mining	Burgersfort			>71			8	Hon	Middle Manager/ Supervisor			
10	Heavy Manufact/ steel	Hoedspruit						9	MA	Accounting/Audit/ Bookkeeper/Credit			
11	Motor/Transp/ Trucking/ parts	Lebowa-khomo						10	Dr	Courier / checker Courier drivers			
12	Bldg & paint Supp/ Constr Ind	Thohoyand Malamulele						11		Admin/ PS Reception			
13	Office furniture Domestic Interior	Steelpoort/ Atok						12		Student			
14	Private/ domestic	Seshego								Trades/ Mechanic			
15	Other/ Education Inst	Jane Furse								Senior Man/ Supervisor			
16	Game farming & Lodges	Groblers-dal								Stock Control/ Store control			
17	Gas suppliers	Sibasa								Sales/ Marketing Merchandisers			
18	Clothing Industry	Bela bela								Armed Response			
19	Legal profession	Giyani								Unemployed			
20	Liquor trade / Soft drink	Letsitele								Tech ops support / Call centre			
21	Petroleum/ Filling stations	Zebediela Matome								Mining all			
22	Vehicle tracking	Bochum Dendron								Professionals			
23	Jewellery Ind												

(n) Polygraph exam focus	(o) Loss value	(p) Poly examination format	(q) Poly result	(r) internal outcome	(s) Disciplinary hearing?	(t) CCMA case?	(u) Criminal charges?	(v) Post confirmation	#
honesty & Integrity	< R1000	USAF MGQT	No Deception	n/a	n/a	n/a	n/a	n/a	1
Theft -Electronic/ Electrical tools	1-5000	3Q AF	Deception	No action	N	confirm	Y	Y	2
Cash/ Money theft	5-10000	2Q AF	Inconclusive	Reprimand	Y	overturn	N	N	3
Theft –stock/ private property/ deliveries	11-25000	ZCT	No Opinion	Final warning	?	reinstate	?	?	4

Sexual harassment	26-50 000	BZT		Dismiss		?			5
Theft - Farm animal /Domestic stock	51-75000	GQT		resign					6
Lie/ deception/ verify issue/ version	76-100	Confirm		Not recruit					7
Copper / metals Other metals theft	101-200	VQT		recruited					8
Theft - Rhino horn & protected species	201-300	BZ		Further Investigation					9
CIT & Armed robbery	301-400	MGQT		Strict Monitoring					10
Fraud/ Skimming/ Credit card crime	401-600	VQT Inv		?					11
Racial abuse	601-800								12
Arson	801-900								13
Food theft/ meal, Meat /flour	901-999								14
Game theft, Poaching	> R1 mil								15
Child abuse/ Indecent assault	n/a								16
Rape	?								17
Oil/ Fuel theft									18
Assault/ violence									19
Damage to Company & Private property									20
Liquor/ Soft Drink theft									21
Gas & cylinder theft									22

ANNEXURE C: Post-examination client confirmation questionnaire

INTERVIEW GUIDE	
POST-EXAMINATION CLIENT CONFIRMATION QUESTIONNARIE (V)	
Reference no: **Date:** **Place:**	
Client:	
Original issue / purpose of the examination **(m) & (n) & (o)**	
Polygraph examination outcome/ results **(q)**	
Internal outcome after polygraph examination results were reported to client **(r)**	
POST-EXAMINATION OPTIONS/ ACTIONS TAKEN	
Disciplinary hearing? **(s)**	
CCMA case? **(t)**	
Criminal charges? **(u)**	
Eventual conclusion/ Post-examination confirmation **(v)**	

ANNEXURE D: Historical perspective questionnaire (Limpopo)

INTERVIEW GUIDE	
HISTORY OF POLYGRAPHY IN LIMPOPO PROVINCE	
Reference no: **Date:** **Method:** **Place:**	
RESEARCHER:	
Investigative & career background	
Academic qualifications	
Polygraph qualifications – where & when obtained	
Company name	
Where located	
When commenced business in Limpopo	
Exam focus: Specific issue/ crime-related % Pre-employment/ periodic screening %	
Main clients/ Industries	
When terminated business in Limpopo	
Total number of exams conducted over that period	

Annexure E: Historical perspective questionnaire (South Africa)

INTERVIEW GUIDE	
HISTORY OF POLYGRAPHY IN SOUTH AFRICA	
Reference no: **Date:** **Method:** **Place:**	
RESEARCHER:	
Investigative & career background	
Academic qualifications	
Polygraph qualifications – where & when obtained	
Company name	
Where located	
When commenced business	
Exam focus Specific/crime-related % Pre-employment/periodic screening %	
Main clients/ Industries	
When terminated business (if applicable)	
Total number of exams conducted over that period	

ANNEXURE F: By-laws of the American Polygraph Association (APA) (Division I-V only)

BY-LAWS: AMERICAN POLYGRAPH ASSOCIATION
(Updated through September 18, 2010)

Page 1 of 25

1. **Division I: Name.**

1.1 This document shall be known as the By-Laws of the American Polygraph Association.

2. **Division II: General provisions.**

2.1 No action or proceeding commenced before these By-Laws take effect, and no right accrued is affected by the provisions of these By-Laws, but all provisions thereafter taken herein shall conform to the provisions of these By-Laws.

3. **Division III: APA Standards of Practice**

3.1 Statement of Purpose

A polygraph examination, properly administered by a well trained and competent polygraph examiner using a valid testing and analysis protocol is the most accurate means known to science for determining whether a person has been truthful. To promote the highest degree of accuracy, the APA establishes for its membership the following Standards of Practice. Moreover, all examinations are required to be conducted in compliance with governing local, state, and federal regulations and laws.

3.2 Definitions

3.2.1 Evidentiary Examination: A polygraph examination, the written and stated purpose for which, agreed to by the parties involved, is to provide the diagnostic opinion of the examiner as evidence in a pending judicial proceeding. This is not intended to prevent admission as evidence of a confession obtained during the examination.

3.2.2 Paired-testing: Polygraph examinations conducted in tandem on two or more individuals regarding a single central contested fact to which all examinees must know the truth thereof. Paired-testing is used by voluntary stipulation between the testifying parties to resolve disputed facts. Paired-testing must be conducted under the same standards as an evidentiary examination.

3.2.3 Investigative Examination: A polygraph examination for which the examination is intended to supplement and assist an investigation and for which the examiner has not been informed and does not reasonably believe that the results of the examination will be tendered for admission as evidence in a court of record. Types of investigative examinations can include applicant testing, counterintelligence screening, and post-conviction sex offender testing, as well as routine multiple-issue or multiple-facet criminal testing. Investigative examinations are required to be conducted with a testing and analysis technique

that has been validated through published and replicated research.

3.2.4 Effective January 1, 2012 (previous passage deleted January 1, 2012)
Validated Testing Technique: A polygraph technique for which exist a body of published and replicated studies demonstrating an average accuracy of:

3.2.4.1 90% or greater for evidentiary examinations, excluding inconclusive results, which cannot exceed 20%.

3.2.4.2 86% or greater for paired-testing examinations, excluding inconclusive results, which cannot exceed 20%.

3.2.4.3 80% or greater for investigative examinations, excluding inconclusive results, which cannot exceed 20%.

3.2.5 Specific Issue Polygraph Examination: A single-issue examination, generally administered in conjunction with an investigation.

3.2.6 Standards of Practice: The generally accepted principles for the best/most appropriate way to conduct a polygraph examination are required to be observed and followed in conducting, analyzing, documenting, and reporting polygraph examinations. Standards are mandatory and may be accompanied by enforcement sanctions.

3.2.7 Guidelines: Recommended practices for the conduct, analysis, documentation and reporting of polygraph examinations. They differ from standards in that standards are mandatory whereas guidelines convey better practices. Within the standards of practice, guidelines are explicitly set forth as recommendations.

3.3 Polygraph Examiner

3.3.1 A polygraph examiner is required to meet the training and educational requirements of his or her category of membership as set forth in the Division V of the By-Laws.

3.3.2 Evidentiary examinations shall be conducted only by a Full or Associate member.

3.3.3 Polygraph examinations of sex offenders as a condition of treatment, probation or parole are required to be conducted by members who have completed specialized training consistent with guidelines found in section 3.11.

3.3.4 A polygraph examiner shall, where applicable, comply with all state continuing education requirements. Practicing examiners shall complete a minimum of 30 continuing education hours every two years in coursework related to the field of polygraphy. A practicing examiner shall be defined as any member who has conducted polygraph training, quality assurance, or examinations in the previous two years. Examiners are responsible for

maintaining records to document that they have met the continuing education requirement.

3.3.5 Examiners are required to accurately represent their category of APA membership, their academic credentials, their licensure, and their certification status.

3.3.6 Polygraph examiners conducting PCSOT tests shall have at least half of their required 30 continuing education hours specific to issues dealing with the testing, treatment or supervision of sex offenders.

3.4 Polygraph Examinee

3.4.1 The examiner is required to make reasonable efforts to determine that the examinee is a fit subject for testing. Basic inquires into the medical and psychological condition of the examinee as well as any recent drug use must be made where allowed by law. Mental, physical or medical conditions of the examinee that should be observable to, or that should be reasonably known by the examiner, are required to be considered in conducting and evaluating the examination.

3.4.2 During the pre-test interview, where allowed by law, the examiner is required to specifically inquire of the person to be examined whether or not he or she is currently receiving or has in the past received medical, psychological or psychiatric treatment or consultation.

3.4.3 If an examiner has a reasonable doubt concerning the ability of an examinee to safely undergo an examination, a release from the examinee and his or her physician is required.

3.5 Instrumentation and Recording

3.5.1 Polygraph examinations are required to be conducted with instrumentation that records with, at a minimum, the following channels or components:

3.5.1.1 Respiration patterns recorded by pneumograph components. Thoracic and abdominal patterns are required to be recorded separately, using two pneumograph components.

3.5.1.2 Electrodermal activity reflecting relative changes in the conductance or resistance of current by the epidermal tissue.

3.5.1.3 Cardiograph to record relative changes in pulse rate, pulse amplitude, and relative blood pressure.

3.5.1.4 A motion sensor is required for all examinations and will become mandatory as of January 1, 2012. This technology is recommended for investigative examinations. Effective January 1, 2012, this section is replaced as

follows (previous passage deleted January 1, 2012): A motion sensor is required for all examinations.

3.5.1.5 Other physiological data may also be recorded during testing, but may not be used to formulate decisions of truthfulness or deception unless validated in replicated and published research.

3.5.2 Physiological recordings during each test are required to be continuous, and are required to be of sufficient amplitude to be easily readable by the examiner and any reviewing examiner. Pneumograph and cardiograph tracings between one-half inch and one inch in amplitude, at the time of data collection, will be considered of sufficient size to be easily readable.

3.5.3 The polygraph instrument is required to be given a functionality or calibration test consistent with manufacturer recommendations and in compliance with state and federal law. Effective January 1, 2012, in the absence of manufacturer's recommendations, examiners should semi-annually record a chart demonstrating correct functioning of the instrument. A functionality or calibration test is required to be administered prior to all evidentiary examinations. These tests, where applicable, are required to be maintained by the examiner for not less than one year.

3.6 Test Location and Conditions

3.6.1 Conditions under which testing occur are required to be free from distractions that would interfere with the ability of the examinee to appropriately focus during the examination process.

3.6.2 Examiners conducting polygraph examinations for public viewing are prohibited from rendering opinions regarding the truthfulness of the examinees on the basis of

that examination. It is recommended examiners attempt to ensure that re-enactments of polygraph examinations are clearly conveyed as such to viewers. Should the examiner determine that the re-enactment will not or has not been clearly conveyed as a re-enactment; the examiner is required to immediately notify the Manager of the APA National Office.

3.7 Preparation

3.7.1 Prior to an examination, the examiner is required to dedicate sufficient time to identify the issues and any potential problem (s) in any area of testing.

3.8 Pre-test Practices

3.8.1 The examiner is required to obtain information sufficient to identify the examinee.

3.8.2 The examiner is required to obtain the consent of the examinee prior to testing. It is recommended the consent of the examinee be obtained after there is a reasonable understanding of the polygraph process, including the duration, the

issues to be covered, and the instrumentation to be used.

3.8.3 Sufficient time is required to be spent during the pre-test interview to ensure that the examinee has a reasonable understanding of the polygraph process and the requirements for cooperation.

3.8.4 Sufficient time is required to be spent to discuss the issues to be tested and to allow the examinee to fully explain his or her answers.

3.8.5 Sufficient time is required to be spent to ensure the examinee recognises and understands each question. Attempts by the examinee to rationalize should be neutralized by a pre-test discussion in which the examinee demonstrates he or she understands the test questions to have the same meaning as does the examiner. Questions are required to be asked in a form that would prevent a reasonable person, facing a significant issue, from successfully engaging in a rationalization process.

3.8.6 The examiner is required not to display or express bias in any manner regarding the truthfulness of the examinee prior to the completion of testing.

3.9 Testing

3.9.1 A member polygraph examiner is required to use validated testing protocols of a validated testing technique. Where examinations deviate from the protocols of a validated testing technique it is recommended the deviations be noted and justified in writing from question onset.

3.9.2 A stimulation test or acquaintance test is required for all evidentiary and initial PCSOT examinations. A stimulation or acquaintance test is recommended for all initial examinations for any specific issue or investigative examination.

3.9.3 For the resolution of specific issues, a validated testing technique must be used.

3.9.4 Questions are required to be asked with clarity and distinctiveness.

3.9.5 Questions are required to be balanced in terms of length and impact for each category of questions utilized. Questions used in the assessment of truth and deception are required to be followed by time intervals of not less the 20 seconds from question onset to question onset. When approved validated research supports the use of another time interval, that time interval will be acceptable.

3.9.6 Examiners are required to collect a sufficient number of charts so as to acquire sufficient data for proper evaluation, in conformance with a validated testing technique.

3.9.7 Nothing in these standards is intended to prevent the use of new or not

validated testing techniques for purposes of research.

3.9.8 Standardized chart markings, recognised and utilized within the polygraph profession shall be employed.

3.9.9 An audio/video recording of the pre-test and in-test phases is required to be made and maintained as part of the examination file for as long as required by regulation or law, but for a minimum of one year for all evidentiary and paired-testing examinations. Audio/video recording is recommended for PCSOT examinations.

3.9.10 A member polygraph examiner is prohibited from conducting more than four investigative or three evidentiary examinations in one day, and no more than five examinations of any type in one day. On rare occasion, exigent circumstances may warrant a waiver of this requirement.

3.10 Scoring

3.10.1 Examiners conclusions and opinions are required to be based on quantitative or numerical scoring for all evidentiary examinations and for all specific issue investigative examinations. The scoring method and decision rules shall have been validated through published and replicated research demonstrating that they are valid and reliable, and appropriate for the type of examination.

3.10.2 Examiner notes of the test evaluation are required to have sufficient clarity and precision so that another examiner could read them.

3.10.3 Examiners are prohibited from disclosing the results of the examination until the analysis has been completed.

3.10.4 Examiners are required to maintain the confidentiality of their work conducted under privilege until a release by the client is obtained.

3.10.5 An examiner subject to a quality control evaluation of a case is required to fully disclose all relevant information regarding the case under review. Any doubts as to relevancy are required to be resolved through disclosure.

3.10.6 Examiners conducting polygraph examinations should annually submit to a quality control review of their work product. The submitted examination should be recorded in its entirety unless precluded by law or government policy, or it should be witnessed in its entirety by the reviewing examiner.

3.11 Standards for Post-Conviction Sex Offender Testing (PCSOT)

3.11.1 PCSOT examiners are required to satisfy the provisions set forth in the Standards of Practice for investigative examinations as well as the following mandatory standard:

Page 7 of 25

3.11.2 Minimum Training: A minimum of 40 hours of specialized instruction through PCSOT training approved by the APA, beyond the basic polygraph training course requirements. In the event an examiner attends and successfully completes the advanced training prior to completing 200 polygraph examinations, the examiner must participate in an internship program consisting of at least 10 PCSOT examinations, under the supervision of a recognised PCSOT examiner, and upon successful completion of that testing, will receive an APA certificate reflecting satisfactory completion of training requirements, thus being considered to possess the requisite knowledge to conduct polygraph testing in conjunction with sex offender treatment and monitoring programs.

3.11.3 Written Examination: Passing a final written examination, approved by the APA or its designated representative is required prior to receiving a certification for the training. The written examinations are required to be properly controlled and protected to prevent exposure of the test questions or answers to any unauthorized persons.

3.11.4 Maintaining of Written Examinations: The instructors of the approved course are required to maintain a copy of the final written examination. Upon completion of the 40-hour PCSOT course instructors are required to administer the examination to

those students who qualify for the final examination. Upon completion of the examination the instructors are required to submit the tests to the APA National Office for scoring verifications.

3.11.5 Recording Requirements: All PCSOT polygraph examinations submitted for quality control are required to be audio/visually recorded in their entirety. When required for quality control purposes these recordings will be made available. All recorded physiological data is required to be retained as part of the examination file as long as required by regulation or law, but for a minimum of one year.

3.11.6 Conflict of Interest: PCSOT examiners who are therapists/treatment providers shall not conduct polygraph examinations on an individual that they directly or indirectly treat or supervise.

3.11.7 PCSOT examiners who are probation or parole officers shall not conduct a polygraph examination on any individual that they directly or indirectly supervise.

4. **Division IV: Code of Ethics**

4.1 Rights of Examinees.

4.1.1 A member shall respect the rights and dignity of all persons to whom they administer polygraph examinations.

4.2 Standards for Rendering Polygraph Decisions.

4.2.1 A member shall not render a conclusive diagnosis when the

physiological records lack sufficient quality and clarity. This may include, but is not limited to, excessively distorted recordings possibly due to manipulations by the examinee, recordings with insufficient responsivity, or recordings with tracing amplitudes less than that generally accepted by the profession.

4.3 Post-Examination Notification of Results.

4.3.1 A member shall afford each examinee a reasonable opportunity to explain physiological reactions to relevant questions in the recordings. There are three exceptions:

4.3.1.1 When the examinee is represented by an attorney who requests that no post-examination interview be conducted, and that the results of the examination be released only to the attorney.

4.3.1.2 When the examination is being conducted by court order which stipulates that no post-examination interview is to be conducted.

4.3.1.3 Instances of operational necessity.

4.4 Restrictions on Rendering Opinions.

4.4.1 A member shall not provide any report or opinion regarding the medical or psychological condition of the examinee for which the member is not professionally qualified to make. This shall not preclude the examiner from describing the appearance or behaviour of the examinee. Polygraph outcome decisions shall be restricted to only those based on polygraph data.

4.5 Restrictions on Examinations.

4.5.1 A member shall not conduct a polygraph examination when there is reason to believe the examination is intended to circumvent or defy the law.

4.6 Fees.

4.6.1 A member shall not solicit or accept fees, gratuities, or gifts that are intended to influence his or her opinion, decision, or report. No member shall set any fee for polygraph services which is contingent upon the findings or results of such services, nor shall any member change his or her fee as a direct result of his or her opinion or decision subsequent to a polygraph examination.

4.7 Standards of Reporting.

4.7.1 A member shall not knowingly submit, or permit employees to submit, a misleading or false polygraph examination report. Each polygraph report shall be a factual, impartial, and objective account of information developed during the examination, and the examiner's professional conclusion based on analysis of the polygraph data.

4.7.2 A member shall maintain for a period of at least one year, all polygraph data and documentation related to the conduct of a polygraph examination.

4.8 Advertisements.

4.8.1 A member shall not knowingly make, publish, or cause to be published any false or misleading statements or advertisements relating to the Association or the polygraph profession. No member shall make any false representation as to category of membership in the Association. All advertisements making reference to membership in the Association shall also list the category of membership.

4.9 Release of Non-relevant Information.

4.9.1 A member shall not disclose to any person any irrelevant personal information gained during the course of a polygraph examination which has no connection to

the relevant issue, and which may embarrass or tend to embarrass the examinee, except where such disclosure is required by law.

4.10 Restrictions on Examination Issues.

4.10.1 A member shall not include in any polygraph examination, questions intended to inquire into or develop information on activities, affiliation, or beliefs on religion, politics, or race except where there is relevancy to a specific investigation.

4.11 APA Oversight Authority.

4.11.1 A member who administers or attempts to administer any polygraph examination in violation of the Code of Ethics or the Standards of Practice may be subject to investigation, censure, suspension or expulsion from the Association, as provided by Article IV of the APA Constitution.

5. **Division V: Membership**

5.1 Full Member.

5.1.1 Full members of this Association are those persons who have:

5.1.1.1 Graduated from an APA Accredited School.

5.1.1.2 Completed not less than two hundred (200) actual polygraph examinations using a standardized polygraph technique as taught at an APA Accredited School and hold a current and valid license to practice polygraphy issued by an state or Federal agency requiring such license.

5.1.1.3 Received a Baccalaureate Degree from a college or university accredited by a regional accreditation board.

5.1.1.4 Full Members shall:

5.1.1.4.1 Have the right to vote in all matters before the General Membership.

5.1.1.4.2 Be eligible to hold any elective office in the Association.

5.1.1.4.3 Be eligible to hold any appointed position in the Association or serve as the Chair of any standing or Ad Hoc Committee, as well as serve as the Chair of any such committee.

5.1.1.4.4 Shall be permitted to cast votes in any election conducted by the Association.

5.1.1.4.5 Shall meet all financial obligations to the Association.

5.2 Associate Member.

5.2.1 Associate Members of this Association are:

5.2.1.1 Persons who are practicing polygraph examiners and who are graduates of an APA Accredited Polygraph school, but do not meet the requirements as Full Member; or,

5.2.1.2 Are graduates of any basic polygraph school of at least six weeks in 2001, and are practicing polygraph examiners; and,

5.2.1.2.1 Have attended an APA sponsored seminar; and,

5.2.1.2.2 Have successfully passed an APA administered written examination; and,

5.2.1.2.3 Have presented the work product (pre-test worksheet, question list, charts and report) from a minimum of ten (10) completed polygraph examinations to the Membership Committee to confirm whether an acceptable level of technical competence has been achieved. If the Membership Committee deems it necessary, any person applying for membership agrees to allow a representative of the Membership Committee to observe a live test administered by the applicant. Any such observation shall be conducted in accordance with existing laws and regulations applicable to that examiner.

5.2.2 Associate members shall be eligible to be upgraded to Full Member status, provided that the following conditions have been satisfied:

5.2.2.1 They have satisfactorily completed a qualifying examination attesting to their knowledge of and competence in the administration of polygraph procedures. This examination shall consist of an oral and written assessment of both academic and practical knowledge of polygraph detection of deception

procedures and shall be administered by the APA Membership Committee.

5.2.2.2 They have been Associate members for not less than 36 months.

5.2.2.3 Within the 36 months preceding upgrading, they have successfully completed either:

5.2.2.3.1 A minimum of 108 hours of continuing education in topics directly related to polygraph testing, including at least one APA annual seminar, during their Associate membership; or,

5.2.2.3.2 They have completed an APA approved refresher course administered by a polygraph training school accredited by the APA.

5.2.2.4 They are in attendance at an APA annual seminar at the time of consideration of their request for upgrading to Full Member.

5.2.2.5 They submit proof of having completed not less than 200 satisfactory polygraph examinations.

5.2.2.6 They hold a current and valid license as a polygraph examiner in the state or other similar governmental jurisdiction of their practice, if at the time of application such license is required by law.

5.2.2.7 They have satisfied all financial obligations to the APA.

5.3.3 Associate Members shall:

5.3.3.1 Have the right to vote in all matters before the General Membership, but not hold any elective office in the Association.

5.3.3.2 Be eligible to hold any appointed position in the Association and Chair any standing or Ad-Hoc Committee.

5.3.3.3 Shall not represent themselves as other than Associate Member of the APA.

5.4 Life Member

5.4.1 A Life Member is any member of the Association:

5.4.1.1 Who has been nominated by another Member for Life Membership, and;

5.4.1.2 Whose nomination has been approved by a two-thirds (2/3) majority vote of the Board, and:

5.4.1.3 Whose nomination has been confirmed by a majority vote of all Voting

Members present at a meeting of the General Membership.

5.4.2 Life Members shall:

5.4.2.1 Have the right to vote in all matters before the General Membership.

5.4.2.2 Be eligible to hold any elective office in the Association.

5.4.2.3 Be eligible to hold any appointed position in the Association and Chair any Standing or Ad-Hoc Committee.

5.4.2.4 Be eligible to serve on any Standing or Ad-Hoc Committee.

5.4.2.5 Be exempt form annual membership dues to the Association.

5.5 Science and Technology Membership.

5.5.1 Science and Technology members are those persons, organizations or corporations who have a professional or scientific interest in the polygraph profession through polygraph research or instrumentation.

5.5.2 Science and Technology members shall:

5.5.2.1 Not have the right to vote in matters before the General Membership.

5.5.2.2 Not be eligible to hold any elective office in the Association.

5.5.2.3 Not be eligible to hold any appointed position in the Association.

5.5.2.4 Be eligible to serve on any Standing or Ad-Hoc Committee.

5.5.2.5 Meet all financial obligations to the Association.

5.6 Honorary Member.

5.6.1 Honorary Members are those persons who:

5.6.1.1 Have made an outstanding contribution to the Association and the polygraph profession, and;

5.6.1.2 Have been nominated by any Member for Honorary Membership, and;

5.6.1.3 Whose nomination has been approved by a two-thirds (2/3) majority vote of the Board, and;

5.6.1.4 Whose nomination has been confirmed by a majority vote of all Voting Members present at a meeting of the General Membership.

5.6.2 Honorary Members shall:

5.6.2.1 Not have the right to vote in matters before the General Membership.

5.6.2.2 Have the right to speak on any issue before the General Membership or the Board of Directors.

5.6.2.3 Not be eligible to hold any elective office in the Association.

5.6.2.4 Not be eligible to Chair any Standing or Ad-Hoc Committee.

5.6.2.5 Be exempt from annual membership dues to the Association.

5.7 Retired Members.

5.7.1 Retired members are those persons who:

5.7.1.1 Are at least 65 years of age.

5.7.1.2 Are no longer engaged in profit-making polygraph employment.

5.7.1.3 Have at least 20 years of membership in the American Polygraph Association.

5.7.1.4 Have attended a minimum of five (5) American Polygraph Association Annual Seminars.

5.7.1.5 Whose nomination has been approved by a two-third (2/3) majority vote of the Board, and;

5.7.1.6 Whose nomination has been confirmed by a majority vote of all Voting Members present at a meeting of the General Membership.

5.7.2 Retired Members shall:

5.7.2.1 Have the right to vote in all matters before the General Membership.

5.7.2.2 Be eligible to hold any elective office in the Association.

5.7.2.3 Be eligible to hold any appointed position in the Association and Chair any Standing or Ad-Hoc Committee.

5.7.2.4 Be eligible to serve on any Standing or Ad-Hoc Committee.

5.7.2.5 Be exempt from annual membership dues to the Association.

ANNEXURE G: Commission for Conciliation, Mediation and Arbitration (CCMA) polygraph testing guidelines

1. What is a polygraph test?

It is a test used to verify a person's truthfulness and is often called a 'Lie detector test.'

2. Is there any law controlling use of polygraph in South Africa?

Polygraph testing is a fairly new concept in South Africa, especially in disputes relating to employment relationships. There is no legislation at this point to control the use of the test or to protect the employee's right against the abuse of the test.

3. Can one be compelled to undergo a polygraph test?

It is against the Constitution of South Africa to compel a person to undergo a polygraph examination, unless she or he consents to it. The consent must be in writing. The individual should be informed that:

- the examinations are voluntary;
- only questions discussed prior to the examination will be used;
- he/she has a right to have an interpreter, if necessary;
- should he/she prefer, another person may be present during the examination,
- provided that person does not interfere in any way with the proceedings;

4. When is the employer permitted to use polygraph?

Generally, employers are permitted to use the polygraph to investigate specific incidents where;

- Employees had access to the property which is the subject of the investigation;
- There is a reasonable suspicion that the employee was involved in the incident;
- There has been economic loss or injury to the employer's business like theft of company property;
- The employer is combating dishonesty in positions of trust;

- The employer is combating serious alcohol, illegal drugs or narcotics abuse and fraudulent behaviour within the company;
- The employer is combating deliberate falsification of documents and lies regarding true identity of the people involved.

5. Who gets the polygraph test results?

Polygraph results cannot be released to any person but to an authorised person.

Generally it is the person who has undergone the polygraph test (examinee), or anyone specifically designated in writing by the examinee, firm, corporation or government agency that requested the examination.

6. What is the status of polygraph testing at the CCMA?

Polygraphists have been accepted as expert witnesses whose evidence needs to be tested for reliability. The duty of the commissioner is to determine the admissibility and reliability of the evidence.

Polygraph test may not be interpreted as implying guilt but may be regarded as an aggravating factor especially where there is other evidence of misconduct. In other words, polygraph test results, on their own, are not a basis for a finding of guilt. It can be used only in support of other evidence.

(Relevant Legislation: The Constitution of the Republic of South Africa, Chapter 2; Rheeder 2010:1)

ANNEXURE H: Key theoretical concepts

Acquaintance test

This short test is conducted prior to the formal polygraph examination, in order to demonstrate the basic concepts of the process to the examinee, to convince him that the process is effective and to reinforce the psychological set of the examinee (USDoD 2006: 21).

Cardiograph

The sensor component of a polygraph instrument that measures the blood pressure, blood volume and heart-rate of the examinee (Matte 1996: 684).

Circumstantial evidence

Evidence that can be concluded or inferred from other relevant indirect evidence (De Villiers & Vorster 1994: 4; Hoffmann & Zeffertt 1994: 589-590; Collins Shorter English dictionary 1994: 201).

Circumstantial polygraph evidence or information

Evidence or information that indirectly links an examinee with an act, event or crime, based on a logical and reasonable conclusion that the examinee had the means, motive and opportunity to carry out the act or crime under investigation (Adaptation of 'circumstantial evidence' by Watson, 2010 from De Villiers & Vorster 1994: 4; Hoffmann & Zeffertt 1994: 589-590 and Collins Shorter English dictionary 1994: 201).

Control or comparison question

A comparison question is intended to elicit a psycho-physiological response from the examinee and is compared with the examinee's psycho-physiological response to a relevant question during a polygraph examination (Krapohl & Sturm 1997: 15).

Control or comparison question technique

A procedure employed in psycho-physiological veracity (truth) examinations that use control questions for comparison with neighbouring relevant questions to reach a decision of truth or deception (Matte 1996: 686).

Corroborative evidence

Supporting facts or new evidence that confirms or substantiates existing information or opinions (Collins Shorter English dictionary 1994: 252).

Corroborative polygraph evidence or information

Relevant, independent polygraph evidence or information that strongly supports and substantiates other information or evidence already known about an event, act or crime under investigation (Adaptation of 'corroborative evidence' by Watson, 2010 from Collins Shorter English dictionary 1994: 252).

Counter-measures

These are deliberate actions, using chemical, mental or physical manipulation, taken during a polygraph examination, in order to manipulate the eventual outcome of a polygraph examination (Jennings & Slupski 1997: 1(2)5).

Deception indicated (DI)

One of four possible outcomes reached at the conclusion of a polygraph examination, indicating that the examinee displayed significant deceptive (untruthful) responses to the relevant questions asked during the examination, and therefore failed the polygraph examination (Krapohl & Sturm 1997: 21; Krapohl & Sturm 2002: 173).

Electrodermal response

The measure of physiological arousal that is determined through skin resistance (GSR) or skin conductivity (GSG) (Matte 1996: 688).

Examinee

In polygraphy terms a person who is voluntarily undergoing or has undergone a polygraph examination (Jennings & Slupski 1997: 1(2)7).

Expert witness

A person who qualifies to be called by any court of law to testify because he is deemed to be an expert in his profession or field of expertise due to his extensive operational and/ or academic knowledge in that specific field (Hoffmann & Zeffertt 1994: 100)

Forensic psychophysiology

A new emerging term for polygraphy or the detection of deception and the verification of truth, as conducted by a polygraphist using a polygraph instrument and recognised polygraph procedures (Matte 1996: 3-4).

Galvanic skin response (GSR)

A measure of physiological arousal determined by the degree to which the skin's resistance to electricity decreases, resulting from an increase in the sweat gland activity (Matte 1996: 690).

Inconclusive (INC)

One of four possible outcomes reached at the conclusion of a polygraph examination, indicating that the polygraphist was unable to reach a conclusive finding on the examinee's degree of deception or truthfulness. This occurs most often when the psycho-physiological responses recorded were not significant enough to make a finding (Krapohl & Sturm 1997: 36; Krapohl & Sturm 2002: 189).

In-examination phase

The second of three phases of a polygraph examination during which the examinee's psycho-physiological responses to the polygraph examination questions is collected by the polygraphist, using a polygraph instrument and recorded in the form of a polygraph chart or chart recording on the polygraph instrument (Jennings & Slupski 1997: 4(2)16).

Irrelevant question

This is a neutral question not intended to evoke any specific response from an innocent or guilty examinee (Matte 1996: 693).

Lie detection

The traditional generic term used when referring to the detection of deception and the verification of truth with the aid of some form of measuring instrument, testing technique and examination questions pertaining to an issue under investigation (Jennings & Slupski 1997: 1(2)10).

Lie detector

The traditional generic term used when referring to the polygraph instrument, that is utilised for the detection of deception and the verification of (Jennings & Slupski 1997: 1(2)10); Krapohl & Sturm 1997: 40).

No deception indicated (NDI)

One of four possible polygraph examination outcomes reached at the conclusion of a polygraph examination, indicating that the examinee displayed 'not deceptive' (untruthful) responses to the relevant questions asked during the examination and therefore passed the polygraph examination (Krapohl & Sturm 1997: 45; Krapohl & Sturm 2002: 199).

No opinion (NO)

One of four possible polygraph examination outcomes reached at the conclusion of a polygraph examination, indicating that the polygraphist was unable to reach a conclusion or finding. This most often occurs when the examination was stopped prematurely, interrupted or when insufficient or unsuitable charts were collected for evaluation (Krapohl & Sturm 1997: 46; Krapohl & Sturm 2002: 200).

Numerical analysis

A numerical scoring system that uses a consistent set of values to evaluate observable physiological responses recorded during a polygraph examination. The two systems most often used are the 3-Point scoring scale and the 7-Point scoring scale (Matte 1996: 695).

Periodic screening

Polygraph examinations conducted at set intervals to verify that employees (examinees) are maintaining the level of honesty and integrity required of them by their employer or the position they occupy (Jennings & Slupski 1997: 8(1)7)

Pneumograph

A mechanical or electronic polygraph component that measures thoracic and abdominal breathing patterns (Matte 1996: 697).

Polygraph charts

The electronic or physical charts that graphically reflect the examinee's psycho-physiological responses to the examination questions asked and have been recorded for evaluation by the polygraphist using a polygraph instrument (Jennings & Slupski 1997: 1(2)15)

Polygraphy

The traditional term used to refer to the practise of polygraph testing by a polygraphist using a polygraph instrument and recognised polygraph examination procedures, for the purpose of detecting deception and verifying truth in a matter under investigation (Jennings & Slupski 1997: 1(2)16; Krapohl & Sturm 1997: 50).

Polygraph instrument

An analogue or computerised instrument designed specifically to record and evaluate at least three psycho-physiological responses of an examinee who is undergoing a polygraph examination for the purposes of detecting deception and verifying truth (Jennings & Slupski 1997: 1(2)16).

Polygraphist

An experienced investigator who has undergone specific and recognised specialised training in the field of polygraphy, and is synonymous with a polygraph examiner (Jennings & Slupski 1997: 1(2)16).

Polygraph examination

The term 'polygraph examination' is the common collective term for the entire polygraph testing process when at least three charts are collected during three successive examinations and evaluated (Jennings & Slupski 1997: 1(2)15).

Post-test phase

The third of three phases of a polygraph examination during which the examinee's polygraph charts reflecting their psycho-physiological responses to the polygraph examination questions are evaluated by the polygraphist and a finding is made or a conclusion is reached as to the examinee's degree of honesty to the issue in question (Jennings & Slupski 1997: 1(2)15).

Pre-employment screening

Polygraph examinations conducted as part of a screening process prior to the recruitment of prospective employees, to determine their level of honesty and integrity and to verify their suitability for the position under consideration (Jennings & Slupski 1997: 8(1)1-3).

Pre-test interview

The first of three phases of a polygraph examination where the examinee's background data is acquired, his voluntary consent is obtained, his suitability to undergo the polygraph examination is determined, the psychological foundation of the examination is laid, the case facts are discussed, the polygraph examination questions are reviewed and the examination procedures are reviewed (Jennings & Slupski 1997: 4(1)1).

Psychological set

The psychophysiological survival or instinctive responses of an examinee to fears, threats, anxieties and apprehensions and his selective focus on the particular issues that present the greatest threat to his immediate safety and well-being (Matte 1996: 698).

Psycho-physiological responses

The specific physiological responses or changes which occur in the cardiovascular system (heart), the respiratory system (breathing) and the skin (sweat gland and electro-dermal activity) of a polygraph examinee, when he is confronted with specific questions during a polygraph examination (Jennings & Slupski 1997: 1(2)19).

Random screening

Polygraph examinations that are conducted randomly and without prior warning to verify that employees (examinees) are maintaining the level of honesty and integrity required of them by their employer or the position they occupy (Jennings & Slupski 1997: 8(1)7).

Relevant question

A relevant question focuses specifically on the issue under investigation or in dispute and aims to elicit a psycho-physiological response from the examinee concerning that issue under investigation during a polygraph examination (Krapohl & Sturm 1997: 58).

Seven-position scoring scale

A numerical scoring procedure that assigns scores ranging from -3 to +3 to the psycho-physiological response of each relevant question recorded on the examinee's polygraph chart (Krapohl & Sturm 1997: 3).

Specific-issue polygraph examinations

Polygraph examinations conducted to investigate a specific issue in dispute, such as a crime, an allegation of sexual harassment or to verify a version of events for example, involving the examinee in question (Jennings & Slupski 1997: 1(2)19).

Three-position scoring scale

A numerical scoring procedure that assigns scores of -1, 0 or +1 to the psycho-physiological response of each relevant question recorded on the examinee's polygraph chart (Krapohl & Sturm 1997: 3).