

**A SECURITY RISK MANAGEMENT APPROACH TO THE PREVENTION OF  
THEFT OF PLATINUM GROUP METALS: CASE STUDY OF IMPALA PLATINUM  
MINES AND REFINERY**

**BY**

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I, **SEADIMO JOSEPH MOKHUANE**, declare that the above thesis is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

I further declare that I have not previously submitted this work, or part of it, for examination at the University of South Africa (UNISA) for another qualification or at any other higher education institution.



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## LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AS	Ammonium Sulphate
Co	Cobalt
Ni	Nickel
Cu	Copper
AFU	Asset Forfeiture Unit
PGMS	Platinum Group Metals
POCA	Prevention of Organised Crime Act
OCU	Organised Crime Unit
Pt	Platinum
Ru	Ruthenium
Rh	Rhodium
Ir	Iridium
Pd	Palladium
Au	Gold
SO	Security Officer
SI	Security Investigator
SM	Security Manager
SAPS	South African Police Service
PMR	Platinum Metals Refinery
BMR	Base Metal Refinery
SLA	Service Level Agreement
CCTV	Closed-Circuit Television
SAP	Security Awareness Programme
POCA	Prevention of Organised Crime Act
LRA	Labour Relations Act
NDPP	National Director of Public Prosecutions
NPA	National Prosecution Authority
SRC	Security Risk Control
DSO	Directorate for Special Operations

<b>ABBREVIATION</b>	<b>DESCRIPTION</b>
SIU	Special Investigations Unit
SARS	South African Revenue Services
SRM	Security Risk Management
SRCM	Security Risk Control Measures
XFBS	X-ray Full Body Scanner
COM	Chamber of Mines

## ABSTRACT

The purpose of this study was to establish the vulnerabilities of the security control measures that are being used at Impala Platinum mines and refinery to prevent the theft of Platinum Group Metals (PGMs). It is important to ensure that the security control measures in place are effective and efficient in preventing the occurrence of such theft.

The research examined the security risk management approach to the prevention of theft of PGMs and the causes of theft of PGMs by organised crime syndicates operating in South Africa and abroad.

The study found that Impala Platinum employees, in collusion with contractors and members of mine security services, are involved in the theft of PGMs.

To achieve the goals and objective of the research study, effective security control measures were identified that will help Impala Platinum mines and refinery to overcome the risks and challenges related to the theft of PGMs.

### **Key terms**

Platinum Group Metals; theft; Security Risk Management Model; security risk management approach; prevention; security risk control measures; analysis; incident reports; organised crime syndicates; protection; behaviour; organised crime threats; *modus operandi*; investigation; recovery process.

## EXECUTIVE SUMMARY

Impala Platinum mines and refinery is the second largest Platinum Group Metals (PGMs) producer in the world after Anglo Platinum mines. The company produces six (6) PGMs, namely; Platinum (Pt), Palladium (Pd), Rhodium (Rh), Ruthenium (Ru), Gold (Au) and Iridium (Ir).

This research study focused on the extent and impact of the theft of PGMs at Impala Platinum mines and their refinery in Rustenburg and Springs respectively in South Africa. It examined the security risk management approach to the prevention of theft of PGMs, vulnerability in security control measures, and causes of theft of PGMs by syndicates. The theft of PGMs material tends to occur above ground during one of the recovery phases in the plant.

The theft of PGMs and the vulnerabilities of the security control measures have the potential to negatively affect the organisation's assets. It is therefore imperative for the security control measures to be effectively and efficiently managed to prevent the theft of PGMs.

The mixed methods research approach was utilised to study the security risk management approach to the prevention of theft of PGMs at Impala Platinum mines and refinery. For the purpose of this research study, explorative research design was utilised. Semi-structured one-on-one interviews were conducted with employees and contractors respectively with the purpose of collecting relevant information for this study. The same interview questions were used for both the employees and contractors.

Three separate questionnaire surveys were used to conduct interviews with security managers, security investigators and security officers working at Impala Platinum mines and refinery. The purpose was to obtain information from the professionals since they are responsible for performing different tasks within their discipline.

They are responsible for protection, prevention and investigation of theft of PGMs and other crimes in their field of work. The respondents were offered adequate times

to complete the questionnaires. Since the research study was conducted on theft of PGMs, case dockets were selected and perused. The purpose was to determine the modus operandi of organised crime syndicates that are involved in the theft of PGMs.

The study found that there was the need for the improvement in the current security measures at Impala Platinum mines and refinery. Based on these findings the researcher made recommendations that will be helpful to the organisation in prevention and protection of theft of PGMs. The recommendations will also be helpful to other mining industry facing challenges in theft of PGMs.

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# CHAPTER 1

## INTRODUCTION AND MOTIVATION FOR THE RESEARCH

### 1.1 INTRODUCTION

This research study focuses on the extent and impact of the theft of Platinum Group Metals (PGMs) at Impala Platinum mines in the Rustenburg area of the North West Province in South Africa, and at the refinery in Springs on the East Rand in Gauteng. The primary platinum producing mines (Anglo Platinum, Impala Platinum and Lonmin Platinum) produce different types of PGMs. They all produce platinum as a primary product of their mines, but with different secondary PGMs. For the purpose of this study, the term PGMs will be used for the metals produced from Impala Platinum – since the case study is at the Impala Platinum mines and refinery.

This research study aims to determine the shortcomings (gaps) and vulnerabilities in existing security measures at the Impala Platinum mines in the North West Province, and the refinery in Springs. Furthermore, it will attempt to identify the underlying causes and reasons for theft of PGMs. Finally, the study aims to analyse and formulate – based on the research findings – improved preventative measures to combat the theft of PGMs from Impala Platinum.

The research study is on the mining industry and more specifically on Impala Platinum mines and the refinery. The researcher became interested in conducting this study as he works for Impala Platinum as Superintendent of Investigations. The work entails investigating crime and any breaches of security procedures.

Impala Platinum is the second largest producer of PGMs in the world. The PGMs produced by Impala Platinum consist of six different PGM commodities: Platinum (Pt), Palladium (Pd), Rhodium (Rh), Ruthenium (Ru), Gold (Au), and Iridium (Ir) (Anon, 2013).

The platinum reefs are igneous – originating from molten volcanic magmata that rose from below the earth's crust and which then cooled and solidified. The precious metals occur in the ore in a variety of patterns and forms and are concentrated in different values. Unlike gold-bearing ore, which is often found in seams where there

are significant concentrations of gold, PGMs are found in the form of minute particles that are generally thinly distributed in the ore. These particles are not visible to the naked eye and do not appear in sufficient concentrations that make it attractive for thieves to remove PGM bearing material from underground mining operations (Anon, 2013).

The theft of material bearing PGMs therefore tends to occur above ground during one of the recovery phases at the mine or refinery. Depending on the mineralogy of the ore, the recovery process of PGMs has to go through four complicated stages of refining: concentration, smelting, base metals' removal, and precious metals' refining (Anon, 2013).

Theft of PGMs in South Africa is a major challenge for the Platinum mining industry, and it has a negative impact on the company concerned because of losses in revenue suffered. The theft of PGMs also has a negative impact on the government, since it suffers large revenue losses due to taxes and royalties not being paid by the syndicates involved in the criminal activities in respect of the stolen product (Potgieter, 2011). PGMs are in great demand in the underworld in any of its forms – varying from low to high grade material at national and international levels (Potgieter, 2011).

## **1.2 PROBLEM STATEMENT**

Impala Platinum periodically experiences theft of PGMs and the losses suffered by the company amount to millions of rands annually. This theft of PGMs is an indication that there is some involvement by company employees in this theft from the company. Security officers whose duties are to protect Impala assets may also be involved in the theft and may connive with dishonest employees inside the company (Anon, 2013).

According to Leedy and Ormrod (2010:48), the core of any research study is the “research problem”. According to Welman et al (2012:14), the researcher studies the problem to obtain a solution for the situation that has been identified as problematic. In addition, Hernon and Schwartz (2007:308) believe that a problem statement should be specific, manageable and written to stimulate the reader interest. The

focus in this research study is the continuous theft of PGMs at Impala Platinum refinery and mines.

According to Gastrow (2001:1), the problem of the theft of PGMs from platinum mines and refinery is confined to a relatively manageable geographical area – in comparison with the much wider distribution of gold and diamond mines across South Africa. It would also appear that there is widespread involvement of a number of organised crime syndicates in the theft of PGMs. Organised crime syndicates involved in the theft of PGMs also commit other crimes such as money laundering, racketeering, drug trafficking, extortion, bribery, and human trafficking (Coetzee & Horn, 2007:82).

### **1.3 AIM OF THE RESEARCH**

According to Mouton (1996:50), the aims of research should illustrate what the researcher wishes to establish through the research. The aim of this research is to explore the implications to the company of the theft of PGMs at Impala Platinum mines and refinery in Springs, and also make recommendations for the prevention thereof. A further aim is to obtain new data on how theft of PGMs is committed as well as the root causes and to establish interesting patterns in the data in order to make certain recommendations that can be used to improve on the security measures in place (Mouton, 1996:103).

### **1.4 PURPOSE OF THE RESEARCH**

According to Welman and Kruger (2001: 18), the purpose of this research is to define, explain and consequently predict or control the human behaviour of employees, its organisations (Impala Platinum) and/or events. There must be a reason (the theft of PGMs) for doing the research, according to Denscombe (2002:25). The purpose of the research is to make predictions about future behaviour and to empower those who are involved in the research (Denscombe, 2002:26-27).

In light of the above, the purpose of this research includes to:

- Identify weaknesses in security measures at Impala Platinum mines and the refinery;
- Investigate the root causes of theft of PGMs;
- Examine the *modus operandi* of the perpetrators;
- Determine whether there is any involvement of security officers in the theft of PGMs; and
- Determine the roles of employees and security officers in the implementation and management of all security measures for mine security.

The overall purpose of this research will therefore be to provide Impala Platinum with guidelines and advice/suggestions on how to improve and implement more effective and efficient security measures for the future prevention of the theft of PGMs at the company's mines and refinery.

Based on the study, and by identifying possible shortcomings or gaps, recommendations are to be formulated regarding the implementation of effective and efficient security measures at Impala Platinum mines and refinery – in order to improve the existing security measures.

## **1.5 RESEARCH QUESTIONS**

According to Creswell (2014: 114) research questions that are asked in mixed methods approach should be applicable to both quantitative and qualitative methods. The author further stated that the research questions seek to address questions which enable the study to archive the objectives. Fouche and De Vos (2011: 89) stated that research questions are core to the research process, accordingly the manner in which research questions are formulated and phrased is critical, since the objective of the research process is aimed at answering the research questions.

The questions posed in this research were as follows:

- What are the causes of theft of PGMs from Impala Platinum?
- Are employees involved in the theft of PGMs?

- What is the role of employees in the theft of PGMs?
- What is the extent of losses suffered by Impala Platinum?
- What security measures are in place in the prevention of theft of PGMs at Impala Platinum mines and refinery?
- Are the security measures in place effective and efficient?
- What are the underlying reasons for the theft of PGMs?
- Are security officers involved in the theft of PGMs?
- Are the contractors working at Impala Platinum involved in the theft of PMGs?
- What is the *modus operandi* used in the theft of PGMs at Impala Platinum mines and refinery?

## **1.6 KEY THEORETICAL CONCEPTS**

According to Leedy and Ormrod (2010: 119), the purpose of defining key concepts is to prevent any misunderstandings. For the purposes of this research, key concepts are defined below:

### **1.6.1 Definitions of terms**

#### ***Theft***

Snyman (1986:511) defines “theft as an unlawful and intentional appropriation of moveable corporeal property belonging to another with the intent to deprive the owner permanently of the property”.

#### ***Platinum Group Metals (PGMs)***

This term refers to any metal of the Platinum group of metals including Rhodium, Gold, Iridium, Palladium, Platinum, Ruthenium, and the ores of such metals (Precious Metals Act No. 37 of 2005).

#### ***Unwrought precious metals***

This term refers to unrefined metals (including concentrate and matte concentrate) or such that has been refined to a purity less than 99.9 per cent and which has not undergone any manufacturing process other than being refined or formed into a bar (but not a minted bar), an ingot, button, plate, sponge, powder, granules (excluding granules made from precious metal) refined to or beyond 99.9 per cent purity carat gold alloys’ solution (Precious Metals Act No. 37 of 2005).

### ***Criminal gang***

According to the Prevention of Organised Crime Act (Act No. 121 of 1998) criminal gang includes any formal or informal ongoing organisation, association, or group of three or more persons, which has as one of its activities the commission of one or more criminal offences, which has an identifiable name or identifying sign or symbol, and whose members individually or collectively engage in or have engaged in a pattern of criminal gang activity.

### ***Security officer***

According to the Private Security Industry Regulation Act (Act No. 56 of 2001), a “security officer is any natural person who is employed by another person, including an organ of state, and who receives or is entitled to receive from such a person any remuneration, reward, fare or benefit, for rendering one or more security service”.

### ***Employee***

According to the Labour Relations Act (Act No. 66 of 1995), an employee is defined as “any person, excluding an independent contractor, who works for another person or for the State and who receives, or is entitled to receive, any remuneration; and any other person who in any manner assists in carrying on or conducting the business of an employer”.

### ***Money laundering***

As indicated in the Prevention of Organised Crime Act No 21 of 1998, money laundering is the financial process used to create the impression or appearance that large amounts of money obtained from serious crimes – such as drug trafficking or terrorist activity – originated from a legitimate source. Various financial strategies are used to achieve this, such as using a legitimate business as a front and pushing the illegitimate proceeds of crime (as cash) through the business’s books.

### ***Racketeering***

As noted in the legal dictionary by Anon (2015), racketeering refers to criminal activity that is performed to benefit an organisation such as a crime syndicate.

Examples of racketeering include extortion, money laundering, bribery, and the obstruction of justice.

### ***Extortion***

Anon (2015) defines an extortion as “the obtaining of property from another induced by wrongful use of actual or threatened force, violence, or fear, or under colour of official right”.

### ***Bribery***

According to the Prevention and Combating of Corrupt Activities Act (Act 12 of 2004), bribery consists of unlawfully and intentionally offering to or agreeing with a state official – to give any consideration in return for action or inaction by him in an official capacity.

### ***Corruption***

Prevention and Combating of Corrupt Activities Act (Act 12 of 2004) illustrate that any person who, directly or indirectly accepts or agrees to accept any gratification from any person, whether for the benefit of himself or for the benefit of another person or gives or agrees to give to any other person any gratification, whether for the benefit of that person or for the benefit of another person is guilty thereof.

### ***Risk***

Valsamakis, Vivian and Du Toit (2005:27) defined risk as the variation of the actual outcome from the expected outcome. Risk therefore implies the presence of uncertainty and then the standard deviation is an appropriate measure of risk. The deviation of an actual outcome from the expected outcome implies that uncertainty surrounds the outcome of the event and the degree of uncertainty of the actual outcome about the expected outcome determines the level of risk which impacts potential loss.

### ***Security risk management***

“Security risk management is the process of assessing risk, taking steps to reduce risks to an acceptable level and maintaining that level of risk” (Blyth & Kovacich, 2006:43-50).

### ***Security risk control measures***

Security risk control measures are defined as measures that positively reduce the ratio of negative to positive outcomes. They are safeguards or countermeasures to avoid, detect, counteract or minimize security risk and help to reduce the risk of damage, or loss or slowing down an attack against an asset (Broder, 2006:4).

### ***X-ray full body scanner***

This is a device that detects objects (PGMs concealed) on a person's body for security screening purposes – without physically removing clothes or making physical contact (Anon, 2015).

## **1.7 VALUE OF THE RESEARCH**

Since no similar research study with a specific focus on PGM mines has been done in South Africa before, the study will provide guidelines to the Platinum mining industry on how to improve any weaknesses which may be revealed in their existing security measures.

The mining industry – in particular Impala Platinum – is losing substantial amounts of money as a result of the involvement of employees and organised crime syndicates in the theft of PGMs. The research will provide directives on how to effectively and efficiently improve security measures to help prevent the theft of PGMs.

## **1.8 LAYOUT OF THE DISSERTATION**

The programme for the remainder of the research is as follows:

### **Chapter 1: Introduction and motivation for the research**

This chapter covers the problem statement, the rationale for the study, concepts, values, and the layout of the dissertation.

### **Chapter 2: Research methodology**

This chapter reviews the varieties of methodological probabilities dealing with primary and secondary data collection and methods of analysis, as implemented by the researcher. It will also outline sampling methods, methods used to collect the

research information in the field, the research problems encountered, and how they were dealt with.

### **Chapter 3: Literature review**

This reviews the existing literature and studies on the selected study topic and highlights gaps and shortcomings in the existing literature – so identifying the knowledge and problems which may exist. This chapter also sets up the research questions.

### **Chapter 4: Research findings and analysis**

This chapter presents the results of the primary research findings and an analysis and interpretation of the data collected.

### **Chapter 5: Conclusion and recommendations**

This chapter summarises the aims in relation to the key findings and points to the implications of the findings for both theory and practice. It also formulates recommendations and possible preventative and reduction measures – to combat the theft of PGMs from the mines and refinery. Finally, recommendations for future research – derived from the study – are made.

## **1.9 CONCLUSION**

This chapter outline the introduction, motivation for the research and problem statement of the study. The chapter further serves to highlight the aim of the research, purpose of the research, research questions and value of the research as well as the definitions for some of the key concepts used in this study. The layout of different chapters is included in this chapter for easy reference. Chapter 2 will focus on the research methodology used during the study.

## CHAPTER 2

### RESEARCH METHODOLOGY

#### 2.1 INTRODUCTION

According to Schoonraad (2003:129), a research methodology is a way to systematically solve the research problem. It may further be understood as being a science of studying how research is done (Schoonraad, 2003:129). The various steps, adopted by the researcher during this research study, are discussed, in order to explain the research process followed.

According to Mouton (1996:37), the methodological dimension of research is distinguished by three levels of application: methodological paradigms, research methods, and research techniques. This distinction between paradigms, methods and techniques will help form a better understanding of the concept 'research methodology' (Schoonraad, 2003:129). The mixed methods approach methodology was used by the researcher for this study to help understanding the research process followed.

Methodological paradigms, which describe the most abstract level, include the distinction between qualitative, quantitative and participatory research. The researcher utilised the mixed methods paradigms during the research study to collect relevant information on the selected topic. The research methods with reference to sampling, data collection and data analysis – was also discussed in this research study.

Leedy and Ormrod (2010:12) differentiate between the terms 'tools' and 'methodology'.

- (i) Tools are those mechanisms or strategies that a researcher uses to collect, manipulate or interpret data.
- (ii) Research methodology refers to those tools the researcher will select to carry out the research project. The authors identified six general tools to research:

- The library and its resources;
- The computer and its software;
- Measurement techniques;
- Statistics;
- The human mind; and
- Language.

The researcher used the tools and research methodology as stated by Leedy and Ormrod (2010: 12) in this research study.

Research techniques represent the most concrete level of the methodological dimension needed to execute specific tasks, and include specific techniques for sampling, data collection and data analysis (Mouton, 1996:37). The researcher also utilised research techniques to help meet the research goal and objective.

## **2.2 RESEARCH DESIGN**

Huysamen (1994:10) defines a research design as “the plan or blueprint according to which data are to be collected to investigate the research hypothesis or question in the most economical manner”. According to Mouton (1996:175), the research design serves to “plan, structure and execute” the research – in order to maximise the “validity of the findings”. Directions from the underlying philosophical assumptions – are given to the research design and data collection.

Yin (2003:19) adds further that colloquially a research design is an action plan for getting from here to there, where “here” may be defined as the initial set of questions to be answered and “there” is some set of conclusions as answers. In other words, the research design is the overall plan of how the research will be done, the methods and the research instrument and/or technique applicable to each method to be used to collect the information, and how the collected information and data will be analysed and interpreted – so leading to the formulation of the research findings.

According to Creswell (2014: 74) research design stipulates what data is required, the methods to be used to gather and analyse the data, as well as how this would ultimately answer the research question. Kumar (2011:94) explains a research design as a procedural plan that is adopted by the researcher to answer validly, objectively, accurately and economically. The researcher conducted empirical research methods in order to answer particular research questions. Moody (2002:1) defines empirical research methods as a class of research methods in which empirical observations or data are collected in order to answer particular research questions.

### **2.2.1 Questionnaires for survey purposes**

According to Gillham (2008:56), a questionnaire is a research instrument which comprises a series of questions and other prompts, for the purpose of gathering information from respondents. The researcher used three separate questionnaire surveys to conduct interviews with the security managers, security officers and investigating officers working at Impala Platinum mines and refinery. Information was sourced from the professionals, since they are responsible for performing different tasks within their discipline – and their job descriptions differ from one another in relation to their daily tasks. This group of professionals were responsible for protection, prevention and investigation of theft of PGMs and other crimes in their field of work respectively.

In developing the questionnaire, the researcher used Mariampolski's (2001:192) guidelines as follows:

- Focus the interviewing, therefore ask fairly general questions in order to stimulate further probing.
- Ask open-ended questions in order to help the interviewee to outline as much as possible.
- Ask contextual questions, for example “what, which, how and when” in order to encourage exploratory answers.
- Use active verbs, for example, describe or explain.

The self-administered questionnaires for security managers contained 19 yes/no questions; 12 point-scale questions, and 20 open-ended questions for a total of 51 questions; questionnaires for security investigators contained 14 yes/no questions, 10 point-scale questions, and 20 open-ended questions for a total of 44 questions; while for security officers there were 5 yes/no questions, 5 point-scale questions, and 12 open-ended questions for a total of 22 questions that needed to be answered. In addition, a questionnaire traditionally provides information which can be expanded on in the one-on-one interviews – in order to gather in-depth qualitative information (see the appendices for the questionnaires, which are listed as **Annexure B** for security managers, **Annexure C** for security investigators, and **Annexure D** for security officers).

### **2.2.2 One-on-one interviews**

According to Mason (2002:62), interviews are one of the most commonly recognised forms of the qualitative research approach, and the researcher utilised interviews as one of his data collecting methods. Interviews enable the researcher face-to-face discussion with respondents. According to Berg (2004: 35), the interview is a very effective method for collecting information for certain types of research questions and dealing with certain types of assumptions. The researcher undertook 40 one-on-one interviews with permanent employees and contractors at Impala Platinum mines and refinery, to collect in-depth, relevant information for the study. Use was made of an interview schedule of questions (see **Annexure F**). Babbie (1992:272) emphasises that it is very important for the interviewer to record the answers exactly and no attempt should be made to summarise, paraphrase or correct bad grammar. In interviewing, researchers have to decide whether to take notes, which could be distracting, or tape the interview, which is accurate, but time consuming (Wisker, 2001:140). The researcher decided to do both, in order not to lose any valuable information.

### **2.2.3 Impala Platinum case docket analysis**

For the purposes of this study case docket analysis was done. A sample of 120 case dockets were selected from a 500 case-docket target population kept at Impala

Platinum mines and refinery – for the period January 2004 and December 2014 (eleven years).

Of the 120 case dockets selected and perused, 90 case dockets were finalised and closed by Impala Platinum mines and refinery. The other 30 case dockets selected were not yet finalised and remained pending at Springs Magistrate Court for further investigation. The researcher was able to peruse pending case dockets where most suspects were caught in possession of PGMs. According to the case docket analysis done, most of the cases indicated that suspects were caught with the product in their possession. The researcher compiled a docket analysis pro-forma (attached in appendices as **Annexure F**). The purpose of the docket analysis pro-forma was to determine the day, time, location, when the theft was committed, the type of product stolen, the value stolen, and the *modus operandi* of criminals and alleged suspects (pending cases). The process of the pro-forma was to obtain information in relation to arrests, disciplinary hearings and the criminal convictions of the accused.

## **2.3 RESEARCH APPROACH**

When conducting a research it is necessary for the researcher to determine which approach would be implemented, since “scientific inquiry in practice typically involves alternating between deduction and induction. Both methods involve interplay of logic and observation. And both are routes to the construction of social theories” (Babbie, 2010:53). In order for the researcher to collect relevant information for the research – both the qualitative and quantitative research approaches were to be used. According to Creswell (2014: 3), research approaches are plans and procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis and interpretation. Creswell (2014: 14) further stated that a mixed methods approach involves combining or integrating qualitative and quantitative research and data in a research study. The researcher followed a mixed method approach in this study.

### **2.3.1 Quantitative research approach**

According to Leedy and Ormrod (2010: 94-95) quantitative research involves quantities where the researcher’s aim is to establish, confirm or validate relationships and to develop generalisations that contribute to existing theories. Mathews and

Ross (2010:478) view quantitative research method as primarily concerned with gathering and working with data that is structured and can be presented numerically. The researcher used quantitative research approach to gather and work with data by delivering questionnaires for completion by the participants.

A quantitative research method involves collecting and converting data into a numerical form so that statistical calculations can be made and conclusions drawn (Anon, 2014). This approach enables the researcher to investigate the predictions about possible relationships between the different variables. The researcher distributed three separate questionnaires to sampled groups of security managers, security investigators, and security officers (total of 90 respondents) at the Impala Platinum mines and refinery in Springs, Gauteng Province, South Africa.

### **2.3.2 Qualitative research approach**

According to Kraska and Neuman (2012:10), qualitative research involves techniques including text, language or visually based data. Henning et al (2011:3), a process which represents a certain freedom in the quest for depth rather than “quantity of understanding”. The researcher demonstrates the key aspects of a qualitative approach as summarised by Kraska and Neuman (2012:261). Creswell (2014: 4) explains qualitative research as an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem.

According to Anon (2014), qualitative research is about recording, analysing and attempting to uncover the deeper meaning and significance of human behaviour and experience – including contradicting beliefs, behaviours and emotions. This approach enabled the researcher to gain a rich and complex understanding of the respondents’ experiences. Mouton and Marais (1996: 155-156) state that the qualitative approach is an approach in which the procedures are not so strictly formalised, while the scope is more likely to be undefined, and a more philosophical mode of operation is adopted. The qualitative approach worked well in this research study, because verbal and non-numerical data were collected through interaction with people in everyday situations. The process has made it possible to record unexpected events and practices. Impala Platinum mines and refinery was

contextualised for the research study, and the qualitative approach involved a research process, combining case studies, interviews and questionnaires.

According to Leedy and Ormrod (2010: 133), the qualitative research approach focuses on phenomena that occur in their natural setting in the 'real world'. The qualitative method was presented in the form of semi-structured individual interviews and as three separate questionnaires for security managers, security investigators, and security officers.

The three separate questionnaires were hand delivered to the respondents to complete, and adequate time was allowed for them to complete the questionnaires. The researcher also had one-on-one interviews with employees and contractors, and notes were taken during that interview schedules.

## **2.4 POPULATION AND SAMPLING PROCEDURE**

### **2.4.1 Sampling size**

According to Black and Champion (1976:167), a sample is a portion of an element taken from a population – which is considered to be representative of the target population sampled. For this study, the target population comprised 150 Protection Services members (security managers, security investigators and security officers), 70 employees and 30 contractors employed permanently at Impala Platinum mines and refinery. For the purposes of this study, a sample of 90 respondents comprising security managers, security investigators and security officers was utilised for the questionnaire survey. For the one-on-one interviews, a sample of 30 employees and 10 contractors was drawn from a target population group.

There are various sampling procedures which can be used. Non-probability sampling includes: convenience, judgement, quota and snowball sampling methods (Babbie & Mouton, 2007:201-202). Probability sampling procedures also has four types: simple random, systematic, stratified, and cluster. For this research, random probability sampling was used by the researcher. Probability sampling – according to Babbie and Mouton (2007:201-202) and Welman and Kruger (2001: 47) – is the most effective method for the selection of study elements, as it avoids the researcher's

conscious or unconscious biases in element selection, and also permits estimates of sampling error. In this way the validity of the data collected can be ensured.

Probability Sampling has a positive influence with regard to the selection of study elements in terms of the accuracy of the research results (Babbie & Mouton, 2007:202). Bailey (1987:81-82) states that the population includes all individuals or cases of a certain type. According to Welman and Kruger (2002:47), a probability sample will ensure that a representative sample is drawn from the population – where each member of the population has an equal opportunity of being selected. As Rescoe (1975), as cited in Sakasan (2000:296) states: “[s]ample sizes larger than 30 and less than 500 are appropriate for most research”. For this research, a sample size of 90 respondents comprising security managers, security investigators and security officers, as well as 30 employees and 10 contractors – for one-on-one interviews – was drawn.

#### **2.4.2 Selection of security managers, investigators and security officers for questionnaire survey**

For this study, the target population comprised 150 Protection Services members (security managers, security investigators and security officers) deployed at Impala Platinum refinery and mines. For the purposes of this study, a sample of 90 respondents comprising security managers, security investigators and security officers was utilised for the questionnaire survey.

The researcher targeted the study population for the questionnaire survey to a sample of 60 security officers, 20 security investigators, and 10 security managers from a target population of 150 including 10 contractors.

Written permission to interview security managers, security investigators, security officers and employees was obtained from Impala Platinum mines and refinery prior to data collection.

According to Mouton and Marais (1996: 50), the aim of the researcher is to study a representative number of people – with a view of generalising the results of the study to a defined population. In this research, the results can be generalised, since the

sample group of 60 security officers, 20 security investigators, and 10 security managers, is a valid representative sample and was chosen without any bias for the target population identified for the study.

#### **2.4.3 Selection of Impala employees and permanent contactors for interviews**

For this research study, the target population comprised 70 employees and 30 permanent contractors deployed at Impala Platinum refinery and mines. For the one-on-one interviews, a sample of 30 employees and 10 contractors was drawn from a target population group. In this study, the outcome can be generalised, since the sample population group of 30 employees and 10 contractors is a valid representative sample group and was chosen without any bias for the target population from a target population of 100.

### **2.5 DATA COLLECTION METHODS AND FIELDWORK PRACTICE**

For this study, four different kinds of data-collection methods were used: physical visits at the refinery, questionnaires, one-on-one interviews, and investigation case dockets. Cohen (1989:181) defines a questionnaire as a self-report instrument used for gathering information about variables of interest for an investigation. For this research, three separate questionnaires were utilised in order to acquire baseline information and to deduce conclusions about the prevention of theft of PGMs.

Maxfield and Babbie (2005:209) emphasise that the value of research depends on how the data are gathered. Most of the data were collected by means of three separate questionnaires. One questionnaire of 22 questions for security officers was compiled, one questionnaire of 44 questions was compiled for security investigators, and 51 questions for security managers were compiled as the group performed different security activities in their workplace – such as guarding, patrolling, monitoring security cameras, investigations and management. The self-administered questionnaires for security managers contained 19 yes/no questions, 14 point-scale questions, and 20 open-ended questions; questionnaires for security investigators contained 14 yes/no questions, 10 point-scale questions, and 20 open-ended questions; and questionnaires for security officers contained 5 yes/no questions, 5 point-scale questions, and 12 open-ended questions – for a total of 117 questions that needed to be answered. The respondents were offered adequate times to

complete the questionnaires since the questionnaires were left with the respondents to complete in their own time – with a given return date (in the appendices the questionnaire for security officers is attached as **Annexure B**; for security investigators as **Annexure C**; and for security managers as **Annexure D**).

For the purpose of this study, the researcher also conducted one-on-one semi-structured interviews involving two interest groups, namely 30 employees and 10 contractors – who are permanently deployed at Impala Platinum mines and refinery. This was because it was the most flexible and useful way of communication. The two interest groups were interviewed so that they could – face-to-face – air their views of the nature and extent of theft of PGMs at Impala Platinum mines and refinery. The researcher posed questions regarding the *modus operandi* of the syndicates to the two interest groups, as well as the syndicate size, in order to explain the way in which PGMs are stolen by the syndicates and the total number of people involved in the theft of PGMs. Where the interviewees failed to provide detailed information or clarity, the researcher will pose additional, probing follow-up questions to obtain more information on the topic. According to Rubin and Rubin (1995:145, as cited in De Vos, Strydom, Fouche & Delpont, 2011: 299), “the interviewer probes to complete or clarify the answer or to request further examples or evidence”. During data collection, the researcher recorded potentially useful data thoroughly, accurately and systematically – by making notes.

Yin (1984:23) defines the case study research method as an empirical inquiry that investigates a contemporary phenomenon within its real-life context, when the boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used. The approach in this research was to investigate the theft of PGMs at Impala Platinum mines and refinery within its real-life context and to obtain sources of evidence for the problem. In this research study, a sample of 120 case docket were selected from a 500 case docket target population of Impala Platinum mines and refinery – for the period January 2004 and December 2014 (eleven years). Of the 120 case docket selected and perused, 90 case docket were finalised and closed by Impala Platinum Refinery. The other 30 case docket selected were not yet finalised – and remain pending at the Springs Magistrate Court for further investigation.

For this study, the researcher utilised five steps: to determine and define the research questions, to select the cases and determine data gathering and analysis techniques, to collect the data, to evaluate and analyse the data, and to prepare the research report.

## **2.6 DATA ANALYSIS AND INTERPRETATION**

Bogdan and Biklen (2003:48) define qualitative data analysis as “working with the data, organising, breaking it into manageable units, coding, synthesising them, and searching for patterns”. The aim of analysis of qualitative data is to discover patterns, concepts, themes and meanings (Yin, 2003: 56). Yin (2003:56) further discusses the need for searching data for “patterns” – which may explain or identify casual links in the database. For this study, the researcher concentrated on the whole dataset first, then attempted to take it apart, and then re-constructed it again more meaningfully after analysis, synthesis and interpretation had been applied. All the data and research information gathered by the researcher were collated, analysed and interpreted by means of categories through constant patterns, themes and meanings. Maxfield and Babbie (2005:107) point out that content analysis by means of decoding is the most suitable technique for qualitative research comparison, discovery of patterns, typologies, matrices or charting by the researcher.

## **2.7 VALIDITY AND RELIABILITY**

### **2.7.1 Ensuring validity**

It is necessary to validate the responses of the respondents. This is done by examining the responses for completeness and honesty to see whether the information provided represents a consensus or a minority (opposing/different) point of view. The researcher ensured that validity – in terms of Welman and Kruger (1999: 100) – was applied during the research process. The researcher ensured that the research questions and interviews conducted were the same, as posed to all respondents and interviewees.

According to Collis and Hussey (2009: 20), validity is when the researcher honestly measures what he/she has set out to do. According to Leedy and Ormrod (2010: 28), “validity of an instrument is the extent to which the instrument measures what it is

supposed to measure”. Validity is concerned with the accuracy of the questions asked, the data collected, and the explanation offered (Denscombe, 2002:100).

In this study, the different forms of validity were applied to all of the instruments.

### ***Content validity***

The content validity of the questionnaire was determined by the literature review, case docket perusal and site visit by the researcher. All the questionnaire survey questions posed to the participants were relevant to the research study, thus ensuring validity. The literature utilised and site visit by the researcher were contemplated to be valid since it consisted of journals, articles and other sources, thereby ensuring validity (Mouton, 2001:101). All the posed questions, data collection and explanations from the respondents were contemplated to be relevant to the research study and ensured validity.

### ***Face validity***

This validity refers to the extent of the research instrument and what it intends to achieve. The one-on-one interview schedule questions posed to the respondents were relevant after considering the concepts and variances involved with the relationships being investigated (Welman et al, 2005;174).

### ***Construct validity***

Construct validity is more concerned with the underlying attributes of the results of the questionnaire. The questionnaires were perused to ensure that the questions posed reflected to the phenomenon of theft of PGMs at Impala Platinum refinery and mines.

Anonymity and confidentiality of the respondents and interviewees was upheld throughout the research process by the researcher. The researcher ensured that all the respondents and interviewees were notified that the information they provide would be treated with the strictest of confidentiality, and that no personal details of the interviewees would be used during the study or revealed in the resulting research report. In other words – identities of individuals participating in the study will remain anonymous (anonymity was guaranteed with no identities being revealed). During

perusal of the Impala Platinum case dockets, personal information with regard to complainant(s), witnesses and accused person(s) was not used in any way during the study. The information obtained from case dockets was also treated with strict confidentiality.

The information provided during the research process was measured and compared to ensure validity and reliability. The researcher used four methods to provide evidence of the validity of the data collected (Leedy & Ormrod, 2010: 92). In ensuring validity, the researcher ensured that the methods used were administered in a consistent way, and that the methods used to collect the data were accurate, honest and on target. The researcher also remained as objective as possible throughout the research study in terms of the four methods used.

### **2.7.2 Ensuring reliability**

Reliability refers to the consistency of the measurement – which means that every time the same variable is measured under different conditions, it will still provide the same or similar results (De Vos et al, 2011: 162-163). According to Maxfield and Babbie (2005:129) and Mouton and Marais (1992: 81), reliability means that the results obtained must be replicable if the same research is conducted by another researcher.

Bless and Higson-Smith (1995:129) state that reliability is the extent to which the observable measures that represent a theoretical concept are accurate and stable when used for the concept in several studies. In achieving reliability, the researcher did in fact ensure that the methods were administered in a consistent and accurate way.

Cohen and Manion (2000:254) define data triangulation as an attempt to map out, or explain more fully, the richness and complexity of human behaviour – by studying it from more than one standpoint. The purpose of data triangulation in mixed methodology is to increase the credibility and validity of the results. The researcher utilised data triangulation to ensure reliability – in which more than one data source was used. The questionnaires consisted of open and closed-ended questions and were triangulated with the other sets of collected information, namely the interviews

and the docket analysis case study – in order to collate the results that were obtained from them all.

## 2.8 ETHICAL CONSIDERATION

According to Leedy and Ormrod (2010: 101-102) and Babbie (2001:38), it is important to comply with the following ethical issues during a research study. The researcher submitted a letter requesting permission to conduct research at the refinery (see **Annexure H** in appendices) and complied as follows:

- *Obtained informed consent from each participant – whether a respondent or interviewee.* In this context voluntary participation is a first prerequisite. Participants should be given sufficient information concerning the research study and topic to be able to make an informed decision about whether to participate or to withdraw. The researcher gave the participants a comprehensive synopsis of the nature of the research, after which the necessary consent was obtained in writing with a signed Consent Form (see **Annexure E** in appendices).
- *Protected the participants from harm.* The researcher endeavoured to conduct the interviews under circumstances where the participants were comfortable and not exposed to any stress or embarrassment.
- *The right to privacy was respected.* No responses by a participant were in any way disclosed by the researcher in a manner that might expose or reveal the identity of specific participant – unless the participant agree in writing to such disclosure. The researcher allocated a code number to each of the participants, in order to honour their privacy and protect their identities.
- *Honesty with professional colleagues.* Researchers may not fabricate data to support a specific finding. The researcher was cognisant of the requirement to ensure that all sources are acknowledged and refrained from plagiarism.
- *Sources consulted.* Reference was made to all sources incorporated in the research, by including them into the list of references.

- *Permission to undertake the research at Impala Platinum mines and refinery was also sought and granted (see approval letter from the Group Production Manager, Impala Platinum, as **Annexure I** in appendices).*

The researcher ensured that during the research study, ethical issues such as protection from harm, informed consent and right to privacy and voluntary participation were considered and adhered to – for the purpose of this research.

The researcher ensured that consent forms (proforma Consent Form in appendices as **Annexure E**) were completed by the interviewees before the interviews were conducted and the interview questions were the same. The consent was also obtained from the respondents who completed the questionnaire survey questions (see example of proforma for the questionnaire respondents in appendices as **Annexure J** for security managers; appendices as **Annexure K** for security investigators and appendices as **Annexure L** for security officers). The survey questionnaire questions were more or less the same although security managers and security investigators questions were longer than that of the security officers. All the participants who were interviewed as well as the participants who completed the survey questionnaire questions were informed about the research study and its objectives.

The researcher ensured that the anonymity of all the interviewees was guaranteed and that compliance with the Code of Ethics for Research of UNISA was instituted throughout. All interviewees were notified that the information they provided would be treated with strict confidentiality.

## **2.9 PROBLEMS ENCOUNTERED DURING RESEARCH**

### **2.9.1 Negative attitude towards completing the questionnaires**

The researcher compiled three questionnaires – one questionnaire each for the security managers, the security investigators, and the security officers at Impala Platinum. All three questionnaires were hand delivered to the respective groups' line managers for distribution to the selected sample population – since they had agreed to participate in the research.

Of the 90 sample population selected, 60 were security officers, 20 were security investigators, and 10 were security managers. The researcher hand delivered 60 questionnaires to security officers, 10 questionnaires to security managers, and 20 questionnaires to security investigators. Of the 60 questionnaires delivered to security officers, only 50 responded by successfully completing and returning them. The 60 questionnaires delivered to security officers differ from the questionnaires sent to security managers and security investigators. The reason why security officers did not respond to all 60 delivered questionnaires was that some had insufficient time to do so. All of the 10 hand-delivered questionnaires to security managers, as well as the 20 questionnaires given to security investigators were successfully completed and returned. In total then, 80 questionnaires were returned of the 90 hand delivered (89% response rate). However, some of respondents complained about the length of the questionnaire: they did not have enough time to complete all the questions in detail as required. The researcher felt that the respondents had a negative attitude about completing the questionnaires – since most of the questions only needed short, detailed ‘yes’ or ‘no’ answers.

### **2.9.2 Geographic difficulties**

The research was undertaken at Impala Platinum refinery and mines. The refinery is in Springs on the East Rand area of Gauteng Province.

The researcher’s focus was on the refinery in Springs, since that is where the product is refined to its last stage: a final ‘pure’ product. Seven PGMs, i.e. Platinum, Palladium, Gold, Ruthenium, Iridium and Silver are produced in the refinery – first in the salt form (yellow substance) and then in the pure end product. It is also where the theft of PGMs is committed. The syndicates consider that it is not worth the effort to steal matte, as the value is too low and the recovery process to convert it to a purer end-product state is too long. The researcher did not encounter any challenges as a result of the study location, since research sites for handing out the questionnaires and one-on-one interviews were within a reasonable travelling distance of each other. The travelling distance is about 25 km – and the researcher lives and works in the Springs area.

### **2.9.3 Incomplete questionnaires**

The researcher received back 80 of the 90 submitted questionnaires. He understood that all incomplete questionnaires were as a result of officers having insufficient time to complete them. Another challenge the researcher encountered was the often illegible handwriting of some of the respondents. The researcher could not always clearly read the answers.

### **2.9.4 Number of completed questionnaires**

In total 90 questionnaires were hand delivered to security officers, security managers, and security investigators. 80 questionnaires were returned successfully completed (ten were not completed). The researcher understood that the response was therefore good, since only ten questionnaires were not filled in at all. In essence, security officers, security investigators and security managers, overall, responded positively to the research.

### **2.9.5 Selection of contractors and employees for one-on-one interviews**

Employees were randomly selected for the interviews. After the researcher identified the employees via the randomly selected sampling method, he then conducted the one-on-one interviews. The researcher compiled a list (schedule) of interview questions, which was used during interviews. For this purpose, 30 employees were selected. All interview questions posed by the researcher to the interviewees were answered by the selected employees.

Ten permanent contractors were also randomly selected for interviews. The same interview questions used for employees were also used during interviews with contractors. The researcher identified the contractors and conducted one-on-one interviews. The identified contractors were from KMA Workforce and LADS construction.

### **2.9.6 Issues regarding case docket analysis**

As soon as the permission letter to undertake the research at Impala Platinum was received by the researcher, 120 case dockets were selected from the Impala Platinum Refinery site. Ninety case dockets that were selected, were finalised, closed and filed by Impala Platinum. The 90 filed case dockets were perused by the

researcher and according to the case dockets, accused persons were found guilty of being in possession of PGMs. The other 30 case dockets were still on the court roll and pending. The researcher was able to peruse pending case dockets – where most suspects were caught in possession of PGMs.

### **2.9.7 Coding of information**

The researcher compiled three different master coding sheets – one for security officers, one for security managers, and one for security investigators. The purpose was to analyse information received from security officers, security managers, and security investigators regarding theft of PGMs, and also their personal views on the matter.

The yes/no questions and the open-ended questions were drawn up in the coding process. The coding lists were captured into the software programme Microsoft Excel, and all answers were categorised. The questions of the three sets of questionnaires, interview responses and dockets analysis, were coded and clustered on Excel spread sheets before statistical analysis was applied to every set of coded question responses.

## **2.10 CONCLUSION**

In this chapter, the researcher utilised the mixed methods paradigms approach to collect relevant information for this study. This chapter provided the empirical component of the research study. It outlines a description of the research strategy, design, approach methods, and techniques/research instruments used to obtain the research information – and also how all the collected information and data were collated, analysed, compared and synthesised in order to obtain the final research results. The different phases of the research methodology were discussed: sampling and population, data collection, data analysis, validity and reliability, as well as ethical considerations.

Chapter 3 will focus on the literature review – wherein the impact and extent of the theft of PGMs is comprehensively discussed.

## CHAPTER 3

### AN OVERVIEW OF THEFT OF PLATINUM GROUP METALS IN SOUTH AFRICA

#### 3.1 INTRODUCTION

Snyman (1986:511) defines theft as an “unlawful and intentional appropriation of moveable corporeal property belonging to another with the intent to deprive the owner permanently of the property”. The crime syndicates operating at, and even from within, the Impala Platinum mines and refinery deprive the organisation permanently of their property – which is Platinum Group Metals (PGMs). Theft of PGMs is driven by organised crime syndicates and involves employees and contractors within Impala Platinum mines and refinery, as well as other syndicates outside Impala Platinum.

This chapter will focus on the extent and impact of the theft of PGMs at Impala Platinum mines and its refinery. This will include the organised crime syndicates and role players that are involved in the theft of PGMs. Although sociologists have offered a number of theories to help explain crime and criminal behaviour, rarely have these been directed specifically at organised crime, as pertaining to the theft of PGMs (Abadinsky, 2013:80). For the purposes of this study, the researcher is of the view that the theft of PGMs in South Africa is by organised crime syndicates, and is therefore a possible explanation of this specific crime and the criminal behaviour of the perpetrators involved.

No hardcopy published academic works made any direct reference to the research topic, but information was found on the topic from the internet and other sources. Therefore, most of the information obtained on the theft of PGMs was from the internet and from data in newspapers, magazines, chronicles, journals, annual general reports. In addition, research information was collected by means of a physical site visit to and observation at the Impala Platinum Refinery in Springs by the researcher.

Hans Merensky – a geologist, prospector, scientist, nature conservationist and philanthropist – unearthed in South Africa some of the greatest mineral deposits. In 1924, he discovered two reefs containing PGMs in what is known as the Bushveld

Igneous Complex: a horse-shoe-shaped geological feature that is confined to the northern parts of the Steelpoort area in Limpopo Province, South Africa. Mining for Platinum ore started in September 1924 and this ore bears the name: the Merensky Reef (Gastrow, 2001:24). Gastrow (2001:24) contends that the problem of product theft from Platinum mines and plants is therefore confined to a relatively manageable geographical area – in comparison to the much wider distribution in South Africa of gold and diamond mines.

### **3.1.1 Platinum Group Metals mining industry in South Africa**

According to the Chamber of Mines of South Africa, the three top mining organisation/companies in South Africa producing PGMs are Anglo Platinum, Impala Platinum and Lonmin Platinum. Impala Platinum operations are based in Rustenburg in the North West Province and at its refinery in Springs on the East Rand in Gauteng Province. The above-mentioned mines produce different PGMs – but their primary product is platinum.

## **3.2 THE ROLE OF PLATINUM GROUP METALS IN SOUTH AFRICA**

According to Coetzee and Horn (2007:1), “the achievements of the mining industry and its contribution to the South African economy are truly remarkable”. According to the authors it is a crucial foreign exchange earner and a substantial contributor to economic production.

The mining industry remains as a leading employer and a leader in the field of technological scientific research – to the benefit of all South African (Coetzee & Horn, 2007:1). The mining industry, and in particular the platinum producing mines, has made a special contribution to the transformation of society and improves the quality of life of South African citizens (Coetzee & Horn, 2007:1).

Impala Platinum mines and refinery produces approximately 4 million ounces of PGMs a year, of which two million ounces is platinum. The operation also produces the highest first-pass yields (PGMs output percentages) in the industry. It employed an average of 52 000 workers, including contractors, in its all operations in South Africa (Anon, 2013).

According to the Chamber of Mines of South Africa, the platinum producing industry is the largest producer of PGMs in the world and produces 75 per cent of the world's PGMs. Platinum is an extremely valuable commodity, as its unique physical and chemical properties allow for unlimited different applications. According to Venter (2006), platinum is sought after worldwide as a result of the higher price compared to other commodities such as Gold, Iridium, Palladium, Ruthenium, and Rhodium. Precious metals are the national asset of South Africa and earn large amounts of foreign currency – and provide substantial employment opportunities (Potgieter, 2011).

South Africa needs a stable and growing mining industry in order to increase its economic growth. Mining has been a key feature of this country's economy for more than 130 years. The mining sector has remained the cornerstone of the economy, even though now smaller, relative to the size of the overall economy. According to the Chamber of Mines (2014), the mining sector accounted for 8.8 per cent of the country's gross domestic product (GDP) on a nominal basis. If the indirect multiplier and induced effects of mining are included, then the overall contribution to GDP is closer to 18 per cent. The mining sector employed about one million people – including nationals from neighbouring countries.

### **3.3 THE FOUR COMPLICATED RECOVERY PROCESSES FOR PGMs**

According to Geldenhuys (2013:19), the high risk areas for theft of PGMs, are in the plants at the refinery, where the ore passes through different phases of crushing, extraction and refining. In other words, the phases of crushing and extraction take place during the process of recovery of PGMs and the final end product is refined into PMGs as required. Some thefts occur at the stage in the recovery process where the base metals are removed from the converter matte (black granules substance) (Geldenhuys, 2013:19). According to Geldenhuys (2013:19), the activities of thieves become more intense as the refining process moves closer to its final stages. An example is when syndicate members deliberately contaminated a batch of platinum sponge during the final refining. They anticipated that the contaminated batch would be rejected and returned for refining in a less secure area – where it would be possible for them to remove and hide it unnoticed. According to Gastrow (2001:25), the recovery process of PGMs has to go through four

complicated stages of concentration, smelting, base metals removal and precious metals refining. The recovery processes of PGMs are outlined as follows:

- *Concentration:* During this process, the ore is deposited into fine particles with the aim of liberating and recovering the mineral particles in the form of a concentrate, by froth flotation.
- *Smelting:* The flotation concentrate is then melted in an electric furnace. On melting, concentrate separates into two layers. The upper layer is a slag, which is tapped off, and then either discarded or returned to concentration. The lower layer is a converter matte, which is sent for base metal removal.
- *Base metal removal:* base metals are removed from the converter matte. They constitute a valuable by-product of PGM extraction and the extent to which they are further refined is largely dictated by economies of scale. The concentrate which remains after the removal of base metals, is the sent for further processing into refined precious metals.
- *Precious metals refining:* Refining processes during this phase differ and improved methods are constantly being introduced. During this time, PGMs are finally separated into individual metals at the Precious Metal Refinery.

### **3.4 PRECIOUS METALS REFINERY PROCESS**

The Precious Metals Refinery (PMR) is part of the Impala Platinum Refinery situated in Springs, Gauteng Province. It is based upon some of the most efficient, discrete, quantitative separation processes available. The PMR receives the dried PGM concentrate from the Base Metal Refinery (BMR), and during this process is when there is theft of PGMs by employees working with the product on a daily basis (Anon, 2013). According to Gastrow (2001:25), the theft of PGMs occurs during the process of the refining where the product is refined into individual PGMs – using highly automated extraction processes that have a positive impact. The PMR plant at Impala Platinum Refinery produces the following PGMs:

- *Platinum* - the premier metal of the group has a number of unique qualities, which make it a sought-after metal for a multitude of applications. It is a key ingredient in the manufacture of environmentally friendly auto catalysts, and fuel cells.
- *Palladium* – also used in the manufacture of auto catalysts and fuel cells. It is again used in the manufacture of electronic components such as multi-layer ceramic capacitors and in dental alloys.
- *Rhodium* – its main use is in auto catalysts. It is also used in the glass making and chemical sectors and in cancer-detecting equipment in the medical sector.
- *Ruthenium* – used in the chemical and electronic industries.
- *Iridium* - also used in electrodes for the production of chlorine, in platinum alloys for use in applications such as jewellery manufacture, and in electrodes for medical devices.
- *Gold* - used in applications such as jewellery and in dental alloys.

### **3.5 EXTENT OF THEFT OF PGMs**

South African Platinum-producing mines face a number of challenges ranging from the 'weak' economy (i.e. particularly the current economic downturn since 2008), rising mining costs to crime (in this case the actual theft of mined PGMs). According to industry sources, South Africa loses billions of rand a year through stolen precious metals which are then smuggled out of the country. The continuing theft of PGMs could negatively influence the profitability of marginal mines to such an extent that the mines would have to stop production and lay off some or their entire workforce (Potgieter, 2011).

According to Coetzee and Horn (2007:10), the theft of PGMs in South Africa is a problem as old as the mining industry itself. South African platinum producing mines face a number of challenges from the strength of the South African economy and

rising mining costs, and also through to crime (Potgieter, 2011). The continuing theft of PGMs could negatively influence the profitability of marginal mines to such an extent that the mines would have to stop production and lay off some of their workforce (Potgieter, 2011).

The theft of PGMs occurs mostly above ground during the extraction process. This is because Platinum can only be removed from its ore state through the complicated process of refining and extraction. In contrast, gold can be easily identified as a valuable metal (Coetzee & Horn, 2007:35).

A Security Risk Management Model was utilised to enable the researcher to conduct this study. In the next section, a description of the model and how security practitioners could apply the model at their organisation – to assist in the fight against crime, in particular the theft of PGMs – is given.

### **3.6 THE ORGANISED CRIME THREATS**

According to the Prevention of Organised Crime Act, 1998 (Act no 121 of 1998) there are measures in place to combat organised crime, money laundering and criminal gang activities – in order to prohibit certain activities relating to racketeering activities. According to the Act, organised crime can be defined as a group of individuals or organisations operating as an illegal business – for profit.

Conklin (2010:73) defines organised crime as criminal activity by an enduring structure or organisation developed or devoted primarily to the pursuit of profit through illegal means. Organised crime has the characteristics of a formal organisation, a division of labour, co-ordination of activities through rules and codes, and allocation of tasks in order to achieve certain goals. The organisation tries to preserve itself in the face of external and internal threats (Anon, 2013).

Swain (2009:5) defines 'organised crime' as a group of individuals or an organisation engaging in criminal activity for the purpose of procuring tangible, political or ideological gain.

According to Potgieter (2011), organised crime in South Africa and internationally poses a huge challenge to the mining industry and to governments. The crime syndicates will always supply the PGMs – as long as there is a market for them.

Coetzee and Horn (2007:74) hold that the government must consider two main concerns when it comes to the organised-crime threat. Firstly, organised crime creates an economy outside the scope of official markets. This part of the economy is not taxable by the state – with considerable loss of revenue implications. Secondly, this is one of the few crimes that threaten the sovereignty of the state; it lays the foundation for corruption within government and political structures. The business sector is also vulnerable to organised crime groups – who use it to launder illicit gains back into the legitimate financial system.

According to the Prevention of Organised Crime Act, organised crime, money laundering and criminal gang activities – both individually and collectively – present a danger to public order and safety, and also economic stability, and have the potential to inflict social damage. The Act, 1998 further states that South African common law and statutory law fail to deal effectively with organised crime, money laundering and criminal gang activities – and also fail to keep pace with international measures aimed at dealing effectively with organised crime, money laundering, and criminal gang activities.

Considering that the mining industry has become a target for organised criminal activity, it is imperative that the problem be addressed with effective collaboration between the mining industry and government – at all levels (Coetzee & Horn, 2007:75). The mining industry – together with the Organised Crime Unit and National Prosecution Authority – should utilise the Prevention of Organised Crime Act to address organised crime activities. The investigation should be conducted in a project that involves law-enforcement agencies and the mining industry.

The Prevention of Organised Crime Act is an effective tool to address organised criminal activities within the mining industry, as it relates to offences such as racketeering, proceeds of unlawful activities, and criminal gang activities. Organised crime syndicate members when apprehended, and offences such as racketeering

and criminal gang activities should be added to the other offences when the suspects are charged. The Act also prescribes the forfeiture of property and preservation of property order.

According to Anon (2013), the criminal threat to the Precious Metals Industry includes two main threats: internal and external. The threats are outlined as follows:

### **3.6.1 Internal threat**

- It is evident that one of the primary threats is from inside the company itself – meaning that own employees, including males and females, are involved in the theft or the facilitation of the theft of PGMs.
- Employees exploit and abuse permanent contractors, including security officers, to remove PGMs from the refinery after being processed in a salt format or when it is pure metal.
- Employees steal PGMs at the refinery in Springs – since they work with the product and have access to it. They hand the product over to the contractors (KMA Workforce, Lads Construction and Bidvest Protea Coin).
- The contractors that are exploited and abused are males, as they are the only permanent contractors (KMA Workforce, Lads Construction and Bidvest Protea Coin) deployed to Impala to perform specific jobs.
- The contractors (KMA Workforce, Lads Construction and Bidvest Protea Coin) are trained by the employees to make up rectum parcels and together with the employees remove it from the refinery.
- When contractors succeed in removing PGMs from the Refinery, they are rewarded by the employees who exploited their positions as contractors – for a job well done.

- If the employees and/or contractors are arrested before removing PGMs from the refinery, the syndicates provide money to the family of the arrested person to pay bail or provide a legal representative (Anon, 2013).

### 3.6.2 External threats

- These include highly sophisticated professional syndicates ranging from Level Two to Level Five operatives (see later section for more detailed explanation of organised crime syndicate levels).
- The crime syndicates have access to illegal and sometimes legal international operations.
- The criminal activities are highly organised – with contacts in the high-ranking structures of the SAPS Organised Crime Unit and even in Parliament.
- Hand-in-hand with money laundering, they also undertake drug smuggling/trafficking and other commercial crimes (Anon, 2013).

### 3.7 **MODUS OPERANDI OF ORGANISED CRIME SYNDICATES**

*Modus operandi* is a Latin term meaning behaviour, comportment or operational procedure (Horgan, 1979:57). According to Du Plessis (1989:84), *modus operandi* is a means of identification which is based on the fact that many offenders tend to use the same method time and again, when committing a crime. A more comprehensive description is that *modus operandi* are the habits and techniques of criminals that over time have become stereotyped and become the routine mode of conduct in which individualised techniques are employed (Van Heerden, 1985:10).

Accordingly, the *modus operandi* for the theft of PGMs can be outlined as follows: Impala Platinum management are in agreement that the theft of PGMs throughout the mining industry is the work of highly sophisticated organised crime syndicates. It was discovered that the theft of these metals was directly linked to a ring of well organised criminals who acquired the product from its source and passed on through

a smuggle chain to various receivers, and on up the chain to Level Five operatives. The latter are usually outside the borders of South Africa (Coetzee & Horn, 2007:81).

So the theft and smuggle chain has many criminal role-players from source (local) to end market (international). So the crime syndicates make use of employees from the mines and the refinery (local level) to acquire the product at source. These employees (as used or manipulated by the organised crime syndicates) tend to make use of condoms, surgical gloves and sample bags to make up parcels suitable to be inserted in the rectum – in order to steal (foundational action in the theft and smuggle chain) and smuggle out the PGMs.

The Level One actors (employees and contractors at source) of the crime syndicates at the refinery, would tape up the PGMs with insulation tape and/or masking tape and hide the product inside body orifices with the motive of taking the PGMs from the refinery. These are known as rectum parcels. They will exit the plant through the search area without being detected (Anon, 2013). It is evident from the research study that these criminals follow a constant, stereotyped pattern of conduct and employ individualised techniques when stealing PGMs.

### **3.8 ORGANISED CRIME SYNDICATES IN SOUTH AFRICA**

The crime syndicates that focus solely on PGMs make the mining industry the victim of organised crime groups. The crime syndicates operate nationally and internationally and are highly organised. They also commit other crimes such as money laundering, racketeering, and other commercial crimes (Coetzee & Horn, 2007:81). The criminal syndicates involved in the theft of PGMs operate nationally and internationally and comprise five levels of criminals (Coetzee & Horn, 2007:81). The crime syndicates are classified into five levels: Level Five at the top of the hierarchy and Level One at the bottom. Level Five syndicates are usually based outside South Africa and Level Four to one operate within the country (Coetzee & Horn, 2007:81).

Goredema (2001:1) defines organised crime, in the South African context, as systematic criminal activity of a serious nature committed by a structured group of individuals or a corporate body in order to obtain, secure or retain, directly or

indirectly, a financial or other material benefit. This definition is broad enough to embrace participation in organised crime groups, serious economic crimes, violent crimes, corruption, money-laundering, the possession of and trafficking in narcotics, trafficking in humans and obstructing of course of justice. In accordance with this definition, there is usually an economic importance at the core of organised crime.

Truong (2001:3) also holds the same view as Goredema regarding the economic rewards of organised crime. He describes an organised crime group as any group that has a corporate structure and whose main aim is to make profit through illegal activities that survive on fear of victims and corruption of business activities.

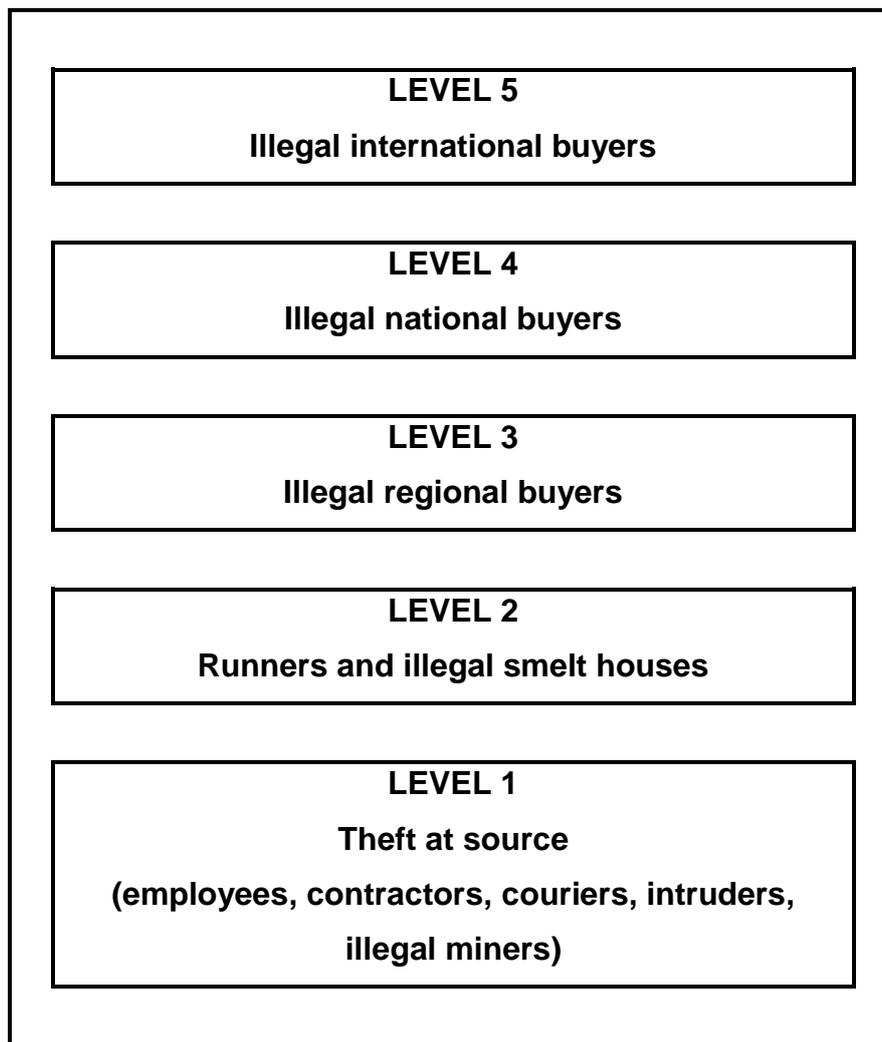
While varying in form and structure, South African organised crime syndicates share a number of common characteristics (Shaw 1998:12), as follows:

- A hierarchy of control, with clearly designated systems of promotion and payment
- Sophisticated procedures, often via legitimate business interest, to launder money by means of illegal activities and
- The use of weapons to ensure that business routes are protected and potential competitors eliminated.

These common characteristics as described by Shaw (1998:12) do not make mention of the fact that, in South Africa, corruption is also at the core of organised criminal groups.

Figure 3.1 indicates the categories of organised crime syndicates operating in South Africa. It illustrates levels from five to one and their roles in the crime environment. The crime syndicates operate in all spheres of South Africa and internationally.

**Figure 3.1: Categories of organised crime syndicates**



(Adapted from Coetzee & Horn, 2007:81)

### **3.8.1 Level Five: Illegal international operatives**

According to Coetzee and Horn (2007:82), the illegal international operatives are generally international buyers who are situated abroad and operate abroad – although they may also have a level of operation in South Africa. They are usually foreign citizens or South Africans who have settled abroad. They purchase mainly from Level Four and sometimes Level Three operatives in South Africa, and usually sell their product to foreign refineries. These illegal international buyers also use the springboard technique and influence high-level law enforcement personnel. They operate on a large scale, purchasing and/or selling high volumes of stolen products, and also assist South African Level Four suppliers to launder the proceeds of the transactions through so-called “currency movers” (Coetzee & Horn, 2007:82).

### **3.8.2 Level Four: Illegal national operatives**

Venter (2006) alluded that Illegal national buyers are based in South Africa, but they mostly sell their products on the international market – mostly refineries or Level Five operatives operating in foreign countries. They sometimes use other African countries as a springboard to export their stolen product to buyers on the European market (Coetzee & Horn, 2007:82). They operate at a high level of sophistication, given the high volume of product they turn over and the high prices paid on the international market. These operatives also enjoy a high standard of living and have a substantial asset base. It is common for these operatives to have both local and overseas bank accounts and they often hold assets in the names of third parties.

They use various forms of money laundering schemes to enable them to clean the proceeds of their illegal business and to maintain their high standard of living in South Africa. Like Level Three operative they only conduct business with selected people such as mine employees and SAPS, and do not commonly participate in that part of the business that carries a high degree of risk. They also contact and influence law-enforcement agencies at a high level and this make it particularly difficult to investigate Level Four operatives successfully (Coetzee & Horn, 2007:82).

### **3.8.3 Level Three: Illegal regional operatives**

These operatives maintain permanent contact with the Level Two operatives and turn over stolen products on a daily basis with large amounts of cash resources on hand to facilitate their activities. The Level Three operatives will receive stolen PGMs from the level two, illegal buyers, or level one, mine employee operatives, on a daily basis – and accumulate large amounts of stolen product before despatching to level four, illegal national operatives, in exchange for money.

Millions of rand are made available by syndicates to obtain the stolen products and also to corrupt and encourage mine employees and others to assume the risk and participate in the enterprise (Venter, 2006). The Level Three operatives are regional buyers situated in South Africa, and mainly operate from the Gauteng and Rustenburg areas. They operate at a high level of sophistication and maintain high-level contact in SAPS and other institutions. They rely on assays of the product for

business purposes and will often use selected laboratories for this purpose (Venter, 2006).

Level 3 operatives rely on others to do the actual work and to assume the risk – and will seldom be in possession of the unwrought precious metal. The Level Three operatives build up a substantial asset base and may have overseas bank accounts – often in the name of third parties. These operatives reap the rewards of large volumes of stolen product and sell to higher levels (level four and five) or even local refineries and jewellers (Coetzee & Horn, 2007:82).

#### **3.8.4 Level Two: Runners and illegal smelt houses**

They mostly operate in specific regions where the producers are situated and have permanent networks in place. They communicate with the members of Level One and remove the product as soon as it becomes available. They are also responsible for the corruption of the Level One operatives and establish and maintain corrupt contacts within the SAPS to ensure the smooth running of their operations (Venter, 2006). These operatives are also involved in the smelting of stolen products through illegal smelting houses. They also put the product together in larger quantities and sell some to the different Level Three operatives or sometimes directly to the Level Four operatives (Coetzee & Horn, 2007:82).

#### **3.8.5 Level One: Employee's operatives**

These operatives steal at source – which is mostly at the mines themselves. Mine and refinery employees individually or in groups are mostly involved at this level and their activities are facilitated by the huge amounts spent by the syndicates on corrupting officials and the breaching of security systems (Coetzee & Horn, 2007:82).

In the court case: *National Director of Public Prosecutions vs. Naidoo and others*, (2006), it was stated that in 1999 investigations commenced into the national and international smuggling arena and evidence was collected about the individuals and criminal syndicates operating and trading in stolen unwrought precious metals in an organised manner, and on an international basis. The project was planned as a long-term investigation, aimed at securing evidence to support a successful prosecution

against identified suspects involved in the illicit PGM market. The investigations were conducted into the affairs of persons and or entities who, nationally and internationally, were involved in the theft and marketing of PGMs (Anon, [sa]).

It was established in the above case that the theft and sale of the stolen product, in whatever form, is committed in a syndicate-driven environment. Investigations clearly indicated five distinguishable levels (as outlined above) in the hierarchy of this type of syndicated driven crime – which had been identified by law-enforcement agencies operating in this field. The five levels of organised crime syndicates involved in the theft of PGMs were identified during the Project Yield investigations (Anon, [sa]). To counter this theft of PGMs, a dedicated investigating and prosecuting capacity was established by the then Directorate for Special Operations (DSO) of the National Prosecuting Authority (NPA) and of the South African Police Services (SAPS) – under the project codename Project Yield – to deal with the crime focus area, namely the theft of precious metals from mines in South Africa (Anon, [sa]).

In the case of *Sidumo and other vs. Rustenburg Platinum Mines Ltd. and others* (2007), Mr Sidumo was dismissed from the company's employ for negligently failing to apply established and detailed individual search procedures, which were significantly different from the random search procedures followed in his earlier post – prior to his transfer to the Redressing Section. The new more rigorous search procedures had been instituted as part of the overall effort to minimise losses due, *inter alia*, to theft. The dismissal followed the holding of an internal disciplinary inquiry and an internal appeal (which was turned down with the outcome of the internal hearing being upheld). Subsequently, Mr Sidumo referred an unfair dismissal dispute to the CCMA in terms of Section 191 (1) (a) of the Labour Relations Act (LRA).

Conciliation failed and the matter was referred to arbitration. The third respondent, CCMA arbitrator, found Mr Sidumo guilty of misconduct, but held that dismissal was not an appropriate or fair sanction. Mr Sidumo was reinstated with three months' compensation subject to a written warning valid for three months. The mine applied to the Labour Court of Appeal, but their appeal action was dismissed with costs. The mine then referred the matter to the Supreme Court of Appeal and the decision of

the Labour Court of Appeal was overturned and substituted with a determination that the dismissal was fair and should therefore be implemented (Anon, 2007).

From the above case law, it was established that the theft of company assets is committed by the syndicates due to the negligence and complacency of the security officer for failing to conduct a detailed individual body search procedure on employees and contractors to prevent any loss for the company. The action of the security officer is significant in the sense that he/she needs to ensure that company assets are always protected from the crime syndicates that operates in the company. In accordance with the hierarchy of the type of syndicate crime level, the security officer is categorised as Level One operative. The company has instituted a new more rigorous search procedure as part of the overall effort to minimise losses due to theft and that particular security officer failed to comply with the search procedure as required by the company. The company instituted disciplinary actions against the employee for failing to comply with the search procedure standard.

In the case of *Maphisa v Impala Platinum Refinery and others* (2015), Mr Maphisa was dismissed for being an accomplice to an attempted theft of PGMs. The dismissal followed on an internal disciplinary inquiry and on an internal appeal. Subsequent to that, Mr Maphisa referred the dispute to the CCMA in terms of Section 191 (1) of the Labour Relations Act (LRA) for an unfair dismissal. The matter was referred to mediation and arbitration.

The first respondent, CCMA arbitrator found that the dismissal was substantively unfair and reinstated Mr Maphisa. The refinery applied to the labour court of appeal and the arbitration award was reviewed. The labour court judgement overturned the decision by the commissioner and set aside the arbitration award. The labour court ruled that the dismissal of Mr Maphisa was substantively fair.

It was established from the above case that Mr Maphisa, an Impala employee was involved in the theft of PGMs and he was colluding with other contractors (KMA Workforce, LADS Construction and Bidvest Protea Coin) to commit such a crime. In terms of the hierarchy of crime syndicate, the employee is regarded as Level One operative as he steals from the source (Refinery). This case indicates that the

employees in the refinery do not work alone but operates in a syndicate – driven environment and exploit the contractors to achieve their ultimate goals of enriching themselves through the company assets (PGMs). To confirm the involvement of the employee (Mr Maphisa), the labour court ruled in favour of the refinery and the employee was dismissed.

### **3.9 THE SECURITY RISK MANAGEMENT MODEL**

In order for any organisation (e.g. Impala Platinum) facing challenges with regard to crime risk (theft), it is recommended that such organisations follow a security risk management process, in order to reduce that specific crime risk (Rogers, 2005:v).

Rogers (2008:152) originally outlined eleven components of the security risk management model (all are of relevance to this study). The model has a cyclic approach with various components that can be implemented by any organisation (for example, Impala Platinum) in terms of policies, procedures and security measures. According to Rogers (2008:152), the components cannot be viewed in isolation – but should be approached as comprising sub-components of an integrated whole, since they are linked and inter-dependent upon each other. Although security measures are in place at Impala Platinum refinery, crime syndicates will always have some means to bypass the security systems, and the model will help to improve the existing security measures so that they become more effective (Rogers, 2005:v).

Figure 3.2 (below) outlines various components of the security risk management model. The discussion of the various components of the model start from step 1 (Factors Causing Crime) of the diagram and work through to the last step (Implementation and Evaluation of Security Measures) of the components.



This model was adapted by Olckers (2007) and by Kole (2010) – with the addition of two components, namely: maintenance and upgrade (Olckers); and service level agreement (Kole).

According to Rogers and Schoeman (2009:45), a change in any of the components will have a negative impact on the other components. For example, “in a case where the risk increases, the risk automatically has a negative impact on the security measures, which have to be improved in managing crime risk. There will be cost implications and policy changes on the part of the organisation may result” (Rogers & Schoeman, 2009:45).

### 3.10 ANALYSIS OF METHOD OF PROTECTION

During the site visit at the Impala mines and refinery, as part of on-site orientation, the researcher compiled a security survey checklist to assist with the process survey.

The table below was utilised by the researcher during the site visit and it illustrate the PGMs that are produced in the refinery, the location of the PMR in the refinery and the security measures in place in the refinery. All the security measures were analysed to identify the vulnerabilities and shortcomings in the refinery.

Table 3.1 below was used during the site visit at Impala Platinum Refinery

**Table 3.1: Impala site Audit Survey Checklist**

<b>CONTROL ISSUE</b>	<b>YES</b>	<b>NO</b>	<b>COMMENTS</b>
<b>A TYPE OF PRODUCT</b>			
1. Platinum			
2. Rhodium			
3. Palladium & Other			
<b>B LOCATION</b>			
1. PMR			
2. BMR			
3. OTHER			

<b>C SECURITY MEASURES</b>			
1. Human Resources			
2. Control Room			
3. CCTV Surveillance			
4. Alarm Systems			
5. Turnstiles			
6. Search Cubicles			
7. Interlocking doors			
8. Metal detectors			
9. Policies & Procedures			
10. Security awareness			
11. Burglar proofing on windows			
12. Security gates			
13. Adequate lighting			
<b>TOTAL YES ANSWERS</b>			
<b>TOTAL NO ANSWERS</b>			
<b>SECURITY WEAKNESS</b>			

With permission being granted by the company (see appendices as **Annexure I**) to undertake the research study, the following were observed by the researcher during the site audit.

From what was observed, it became more apparent to the researcher that despite the security measures in place, theft of PGMs at Impala occurred in most instances and that should be a concern to the management at the refinery.

**3.10.1 Type of product**

Although the Rhodium price fluctuates to be greater than the Platinum price, crime syndicates focus more on theft of Platinum. Platinum is the primary product at Impala Platinum refinery and is more in demand by the underworld market. The Platinum underworld market is easily accessible and crime syndicates (Regional, National and International levels) outside Impala concentrate on Platinum in most instances. The employees, contractors and security officers (level one operatives) in the refinery are

well aware that PGMs (Platinum) is more in demand and it is easily smuggled from the refinery to the underworld crime syndicates (levels two – five).

### **3.10.2 Human resource**

There are well trained security officers deployed at Impala Platinum refinery. The refinery has outsourced security service provider, Bidvest Protea Coin Security Services to render essential services and to protect the assets of the company, premises, and employees. The company provides security services at the refinery and has deployed 160 security officers including administration staff. The security officers had to conduct detail individual search procedures on employees (Impala), contractors (KMA Workforce and Lads Construction) and security officers (Bidvest Protea Coin) on exiting through the search lanes and cubicles. They also perform patrol duties, escort PGMs to OR Tambo airport, conduct investigations, access control and monitoring of CCTV surveillance cameras.

### **3.10.3 Control room**

There are two control rooms situated at the refinery are manned 24/7 by security officers. The security officers work under the supervision of Senior Shift Supervisors (SSS) in a shift. The duties of a security officer include to monitor CCTV cameras and report any criminal activities that will be observed to the management for further investigation purposes. The security officers also monitored the tracking devices on the transportation of the PGMs to OR Tambo airport. The officers have to ensure that all cameras within the refinery are in working condition. Any damages or broken cameras have to be reported immediately to be repaired. There is also a Third Tier (control room) which oversees the two control rooms to ensure the effective monitoring of CCTV cameras and is manned by 24/7.

### **3.10.4 CCTV surveillance**

There are more than 500 CCTV surveillance cameras installed that cover strategic and high risk areas in the refinery. There are also CCTV surveillance cameras inside the search cubicle and all these cameras are monitored from the two control rooms. There is a Third Tier (Control room) which oversees both control rooms to ensure that CCTV surveillance cameras are effectively monitored. The CCTV surveillance

cameras footages are also used for the investigations purposes during internal disciplinary enquiries and for the court cases purposes.

### **3.10.5 Alarm system**

All domains in the refinery, where the product is produced and kept in a locked place, have an alarm intrusion system. The alarm systems are integrated into the control rooms and monitored from them, whenever an alarm is activated, it alerts the control room in case an intruder disarms the system and/or if someone is entering the area without been noticed. The security officer will then inform relevant stakeholders for the necessary action.

### **3.10.6 Access control**

There are turnstiles in most areas in the refinery where one has to swipe his/her access card before entering or exiting the area. The refinery has used access cards (proximity cards) to employees, contractors and security officers to access area of work, to identify its employees as well as the contractors (KMA Workforce, LADS construction and Bidvest Protea Coin) and those access cards are also used to report on/off duty. The person issued with the card is responsible for it and it should be kept in his/her possession at all times.

### **3.10.7 Search cubicles**

The search cubicles are confine spaces which accommodates two people, the security officer who conducts the search and the person who is being searched. The search cubicles are under constant CCTV surveillance cameras and are monitored in the control rooms. There is also audio transmission system to listen to the conversations of the people inside the search cubicles.

### **3.10.8 Metal detectors**

Metal detectors are used by security officers to conduct non-physical body searches on employees, contractors and security officers exiting the refinery. The purpose of the use of the metal detector is to detect foreign objects inside the bodies of employees, contractors and security officers exiting through the search cubicles. When searches are conducted, the metal detector is switched on and a green light illuminates indicating that the metal detector is operational. Whenever a metal

detector activates, a red light illuminates with a sound and that will be an indication of a foreign object being detected inside the body of an individual.

### **3.10.9 Policies and procedures**

Policies and procedures are in place as operating guidelines. They form part of a comprehensive security plan which security officers need to implement, manage and monitor while ensuring that employees and contractors comply with them. Procedures and policies serve as a guideline to security officers on how to conduct a detailed individual search on employees and contractors.

### **3.10.10 Security awareness**

It is part of pro-active measures in dealing with crime at the workplace. Security awareness flyers are being distributed by the security department as part of pro-active measures amongst the employees and contractors, to inform them about setbacks of crime in general and also about the theft of PGMs in the company. Security awareness such as security induction is used to inform the employees and contractors regarding consequences of being involved in criminal activities and that any PGMs found in the refinery has to be reported to security for further investigations.

## **3.11 ANALYSIS OF IMPALA MINES CASE DOCKETS**

During site visit, the researcher perused 120 case dockets with the intention of determining the criminological investigations and to have an insight into the theft of PGMs, how the cases were investigated, how the case dockets were closed, what information was provided on the nature and circumstances of the crime, the profiles of the perpetrators, actions taken against the offenders (departmental enquiries and criminal courts).

From the analysis observed, the researcher established that all relevant information about the theft of PGMs and the basic facts and demographic information regarding the incident, statements of witnesses, statement of the suspect, details of the suspect, details undertaken by the security investigator dealing with case, progress of the disciplinary actions and the progress of the case through the criminal justice system were contained in the case dockets. The researcher established that case

dockets inspection is conducted on monthly basis as well as prior court appearances and after court appearances. All case dockets that are finalised at the court are closed and filed.

The court outcome, as well as the disciplinary actions instituted of each and every case, are indicated on the outside of the case dockets by the investigator and the investigations manager will close the docket thereafter for filing purposes. The refinery case dockets information is exactly the same as the SAPS case dockets pertaining to the details of the suspect, information on crime, place, time and diary section where the investigator record all the activities undertaken during investigations.

### **3.12 ANALYSIS OF INCIDENT REPORTS AT IMPALA PLATINUM MINES**

The crime statistics obtained from Impala Platinum mines and refinery illustrates that a total of 75 kilograms of PGMs were recovered for the period 2004-2014 (eleven years) – where suspects could not be detected (Anon, 2014). The total value of these recovered PGMs was R13 904 000, and indicates that Impala incurs millions of rand in losses as a result of theft of PGMs, even though the product is insured. The Precious Metal Refinery (PMR) Plant is the vulnerable location where most PGMs theft occurs (Anon, 2014).

The following tables and figures list statistics obtained by the researcher during the study with regard to recoveries of PGMs at Impala Platinum mines and refinery without suspects being arrested; recoveries of PGMs with suspects being arrested; the value of PGMs stolen and recovered; cases reported and investigated by Impala Platinum, as well as the total number of suspects arrested.

**Table 3.2: Impala Platinum mines and refinery statistics of recovered PGMs (January 2004-December 2014)**

<b>YEAR</b>	<b>MASS (KG)</b>	<b>VALUE (R)</b>	<b>LOCATION</b>
2004	5.4	900 000	PMR
2005	5	842 000	PMR
2006	5.1	894 000	PMR
2007	5.9	1 000 000	PMR
2008	5.5	928 000	PMR
2009	11	2 000 000	PMR
2010	11.1	2 110 000	PMR
2011	6.5	1 300 000	PMR
2012	6	1 000 000	PMR
2013	6.18	1 280 000	PMR
2014	7	1 560 000	PMR
<b>TOTAL</b>	<b>75</b>	<b>13 904 000</b>	
PMR = Platinum Metals Refinery, Springs			

(Impala Incident Report, 2004-2014)

According to Table 3.2 (above), in 2009 and 2010, more PGMs were recovered than any of the other years under review. The value for 2009 and 2010 is estimated at R4 110 000. The value of the PGMs recovered in 2010 is greater than any of the other years under review, and amounts to R2 110 000. The total value of PGMs recovered where suspects were not detected and arrested amounts to R13 904 000. The location where PGMs were recovered is at the PMR Plant at Impala Platinum Refinery in Springs, Gauteng Province, and may indicate that employees, contractors and security personnel working at the PMR Plant are the ones involved in the theft of PGMs. The PGMs were recovered hidden in different place in the PMR refinery.

**Table 3.3: Impala Platinum mines and refinery statistics of recovered PGMs with number of suspects (January 2004-December 2014)**

<b>YEAR</b>	<b>MASS (KG)</b>	<b>VALUE (R)</b>	<b>LOCATION</b>	<b>SUSPECTS</b>
2004	8	1 380 000	PMR	19
2005	9	1 400 000	PMR	12
2006	13	2 300 000	PMR	18
2007	11	2 050 000	PMR	15
2008	7	1 350 000	PMR	11
2009	12	2 200 000	PMR	17
2010	11.8	2 140 000	PMR	16
2011	14.5	2 910 000	PMR	21
2012	10.6	1 570 000	PMR	18
2013	15.8	3 122 222	PMR	17
2014	10	2 100 000	PMR	15
<b>TOTAL</b>	<b>123</b>	<b>22 522 222</b>		<b>179</b>

(Impala PGMs Reports, 2004-2014)

Table 3.3 (above) indicates that in 2011, 21 suspects were arrested for theft and 14.5 kg of PGMS were recovered from the suspects. During 2011, the most PGMs were recovered and there were more suspects, bigger masses (15.8 kg) and values (R3 122 222 in values) – compared to other years during the period 2004-2014. In terms of PGMs recovered, 2010 follows with 14.5 kg, valued R2 910 000. In terms of suspects arrested the year 2004 follows with 19 suspects arrested. The total number of suspects arrested for the period 2004-2014 is 179, and the total amount of PGMs recovered was 123 kg, with its total value being R22 522 222. Thus Impala incurs millions of rand in losses as a result of employees, security officers and contractors who are involved in criminal activities.

**Table 3.4: Cases reported and investigated by Impala Platinum investigators for theft of PGMs with number of suspects (January 2004-December 2014)**

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
18	22	14	26	30	35	38	30	29	17	15

(Impala Cases Report, 2004-2014)

The most cases of theft of PGMs reported were in 2010 – where 38 cases were investigated with no trace of the suspects involved followed by 2009 – where 35 cases were investigated. The fewest cases reported were in 2006 (total of 14). During the period 2004-2014, a total of 274 cases were reported and investigated by the investigation department of Impala Protection Services.

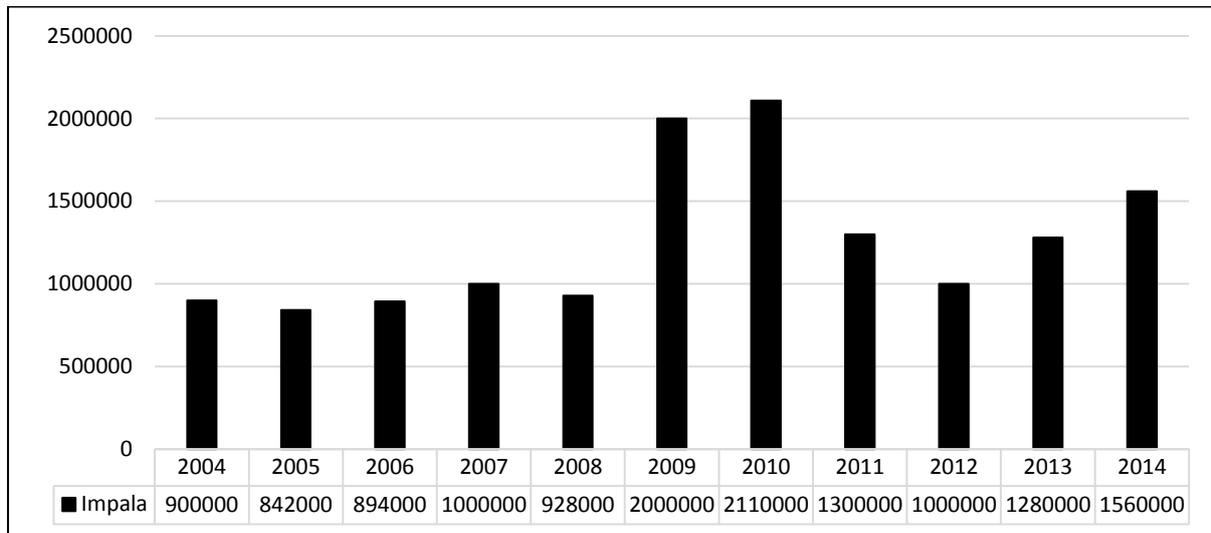
**Table 3.5: Reported cases where employees, contractors and security officers were involved in the theft of PGMs (January 2004-December 2014)**

EMPLOYEES	CONTRACTORS	SECURITY OFFICERS
82	71	26

(Impala Suspects Report, 2004-2014)

Table 3.5 (above) illustrates the cases reported where employees, contractors and security officers were involved in the theft of PGMs at Impala Platinum mines and refinery – for the period 2004 to 2014. The total number of employees arrested was 82 – with 71 contractors and 26 security officers also arrested. This indicates that theft is committed by the people working at Impala Platinum mines and refinery. The total number of people arrested for theft of PGMs – for the period 2004 to 2014 was 179.

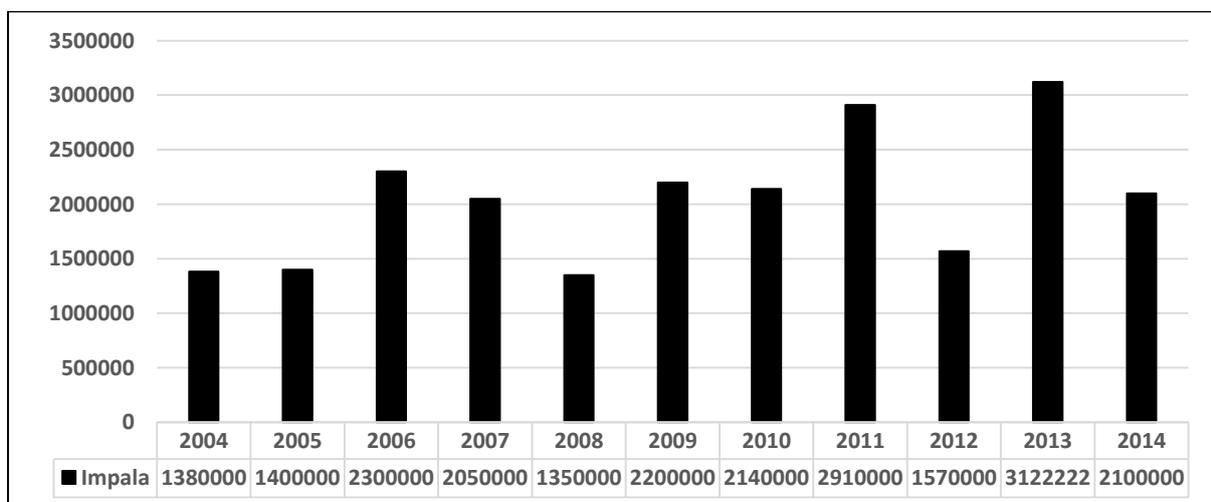
**Figure 3.3: Total value (Rand) of PGMs recovered by Impala Platinum (2004-2014)**



(Impala Number of Suspects Reports, 2004-2014).

Figure 3.3 (above) illustrates the value in the recovery of PGMs from 2004 to 2014. According to the figures, 2010 was the year when most PGMs were recovered (total value of R2 110 000), followed by 2009 (total value of R2 000 000). The year 2005 had the least recovery of PGMs (total value of R842 000). The years 2007 and 2012 were the same in terms of recoveries – each with a total value of R1 000 000.

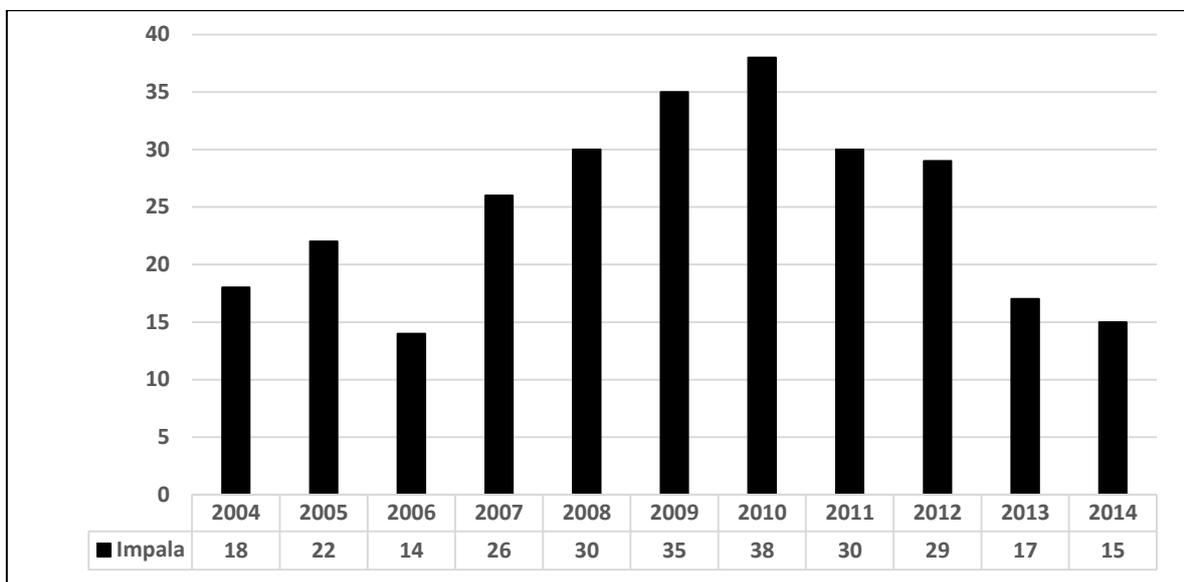
**Figure 3.4: Total value (Rand) of PGMs recovered by Impala Platinum where suspects arrested (2004–2014)**



(Impala Number of Suspects Reports, 2004-2014).

Figure 3.4 (above) indicates the total value of PGMs recovered where suspects were arrested from 2004-2014. According to the figures as illustrated, 2013 was the year with the greatest value (R3 122 222) where PGMs were recovered, followed by 2011 (total value of (R2 910 000). The PGMs were recovered from the suspects during arrests and were found in possession of them. Between the year 2004-2014, the total value of PGMs recovered was R22 522 222. The year 2008 had the least recovery of PGMs (total value R1 350 000).

**Figure 3.5: Total number of cases investigated by Impala Platinum (2004-2014)**



(Impala Case Reports, 2004-2014).

According to Figure 3.5 (above), the highest number of cases investigated by Impala Platinum was in 2010 – with total of 38 case dockets. This total is followed by the year 2009 with 35 case dockets. The least cases investigated were in 2006 – with a total of only 14. The total cases investigated from 2004-2014 were 274.

### **3.13 ORGANISED CRIME SYNDICATES INVOLVED IN THE THEFT OF PGMs AT IMPALA PLATINUM MINES**

According to statistics from Impala Platinum, most people involved in the theft of PGMs are employees who have access to the product in the PMR plant. They act on their own, individually or in groups to get hold of the product from the place of origin. Only the Process Controllers who are ensuring the process, are predictable, stable

and consistently operating at the target level of performance with only some normal variation – deal directly with the product.

The employees also involve contractors from KMA Workforce, Lads Construction and Bidvest Protea Coin in the theft of the platinum at the refinery. Some of the contractors employed by companies (KMA Workforce, Lads Construction and Bidvest Protea Coin) at the refinery are used by the employees (process controllers) to remove PGMs from the plant, through the security system – i.e. searches. The employees would remove the PGMs from the place of origin in the refinery, hand it over to the contractor, who will then conceal it and take it through the searches (Anon, 2013). The Security Officers on duty would collude with both employees and contractors (KMA Workforce, Lads Construction and Bidvest Protea Coin) to steal the PGMs from the refinery. This collusion involved the non-implementation of conducting detailed individual search procedures. These search procedures are part of the overall efforts to minimise losses due to, among other things, theft from the company premises (Anon, 2013).

The security officers would also receive quantities of PGMs already made up in parcels for removal from the PMR plant employees. The security officers then conceal it (see below the detailed exposition of the methods used by them for concealment and smuggling out) and remove it from the PMR plant – all without being properly searched. The security officer deployed at the searches will arrange with another security officer who would be in possession of PGMs to be searched by that specific officer – and the detailed individual search procedure will not be adhered to by the two in collusion with the primary thief, and the rest of the organised syndicate. The Security Officer with the concealed PGMs would then be able to go through the search area without the PGMs being detected (Anon, 2013).

These organised crime syndicate activities are facilitated by huge amounts of money spent by the syndicates on corrupting officials (SAPS) and the breaching of security systems (Coetzee & Horn, 2007: 34). The crime syndicates would pay the SAPS members huge amount of money in favour of not being arrested for the unlawful activities and in smuggling in PGMs. The PGMs would then be sold to the level two, i.e. illegal buyers and runner operatives, who operate in specific areas where

producers are situated and have permanent networks in place. The Level Two operatives are also involved in the smelting of stolen product through illegal smelting houses (Coetzee & Horn, 2007:81).

The PGMs that are stolen by the employees and/or security officers are stolen in small quantities (grams). The stolen product would be placed in a sample plastic bag and masking tape would be used to make up a rectum parcel – as illustrated in the image below – or placed in surgical gloves as illustrated in Image 3.2 (Anon, 2013).

**Image 3.1: Format 1 of rectum parcels containing PGMs**



Rectum parcel recovered from a suspect after being arrested – salt format (Impala Platinum, 2006)

**Image 3.2: Format 2 of rectum parcels containing PGMs**



Rectum parcel recovered from suspect after arrest – salt format (Impala Platinum, 2010).

The images above indicate one of the methods used when PGMs are removed from the plant by employees and/or security officers. The syndicates' members conceal the product inside their bodies – knowing that the metal detectors are ineffective and do not pick-up the parcels as it contains salts and not metals. The metal detectors only activates on metals detected during searches. The above images illustrate the typical rectum parcel and the manner in which it is used to remove PGMs from the place of origin by the crime syndicates in a salt form (a yellow substance). This manner of theft is effective for the syndicates, since it cannot be easily detected. It is the technique used in most cases as it is the easiest way to remove the product from the plant – and it is not easily detected by the metal detector.

**Image 3.3: Format 3: Surgical gloves containing PGMs**



Recovered PGMs in surgical gloves concealed in underwear of suspect, after arrest – salt format (Impala Platinum, 2006).

The photo above indicates the manner in which employees, contractors and security officers remove the PGMs from the PMR plant. The syndicates use disposable surgical gloves – which are normally used during medical examinations and procedures. They pack PGMs inside, and conceal them under their bodies between their legs in salt form (yellow substance), or metal form. The photo illustrates platinum salt which is the easiest product to steal from the refinery process. This was recovered from the suspect after a medical X-ray was taken by the personnel at the refinery clinic (Anon, 2013).

**Image 3.4: Recovered format of rectum parcels containing PGMs**



Recovered PGMs in a rectum format from a suspect on exiting the refinery (Impala, 2013).

The image (above) illustrates the *modus operandi* of crime syndicates at the refinery (level one operatives), the rectum parcels wrapped with an insulation tape. The crime syndicates will place the material in a sample plastic bag and use the insulation tape to wrap the material in a rectum format. The PGMs wrapped in an insulation tape are in a salt format and the metal detector cannot activate when used to do a detailed individual search on a person.

**Image 3.5: Recovered surgical gloves rectum parcels containing PGMs**



Recovered PGMs found hidden inside the refinery (Impala PGMs Report, 2013)

The image (above) reflects the manner in which PGMs are removed from the refinery by the syndicates. The syndicates hide the material between their legs and this makes it difficult for a metal detector to can detect the parcels as it is in a salt format. The syndicates are aware that the metal detector does not activate if the parcel is in a salt format unless the parcel is in a metal format it is when the metal detector will activate. The collusion between the employees, contractors and security officers could be the reason for them to know about the ineffectiveness of the metal detector.

The security officer will utilise the metal detector, a device which responds to metal at a distance, to conduct a detailed individual search procedure to ensure that the individual is free from PGMs or not in possession of them. When a metal detector activates during the search on an individual, he or she will be taken to the Impala

Medical Clinic at the refinery for a medical X-ray – to establish if the individual is in possession of PGMs (Anon, 2013). The second method used is surgical gloves (placement of the PGMs in the surgical gloves). The search area has a search cubicle where only one security officer and the individual enter – for the search to be conducted in private.

**Image 3.6: Type of metal detectors used by security officers**



Example of metal detectors usually used to conduct detailed, individual search procedures (Impala Platinum, 2006).

The above image illustrates the type of metal detectors used by the security officers when conducting detailed, individual search procedure. The metal detectors are not that effective and cannot easily detect PGMs in a salt form (yellow substance), since the salt does not contain metal. However, the syndicate member's body language might suggest suspicious activity.

Metal detectors use an electromagnetic field to detect any foreign object in the person's body. The metal detectors used by Impala Platinum refinery are ineffective in detecting foreign objects (PGMs) inside the person's body (it does not contain

metal) and cannot be activated if someone is in possession of PGMs as it cannot detect PGMs in salt form (yellow substance does not contain metal).

Since the employees at Impala Platinum mine and refinery are involved with crime syndicates in terms of the theft of PGMs, it is appropriate to use investigation methods such as surveillance to constantly and intensively monitor the suspects, and to use an agent or informer to infiltrate the syndicate to gather evidence and information and/or to penetrate the syndicate by recruiting members from the syndicate to investigate employees and organised crime syndicates. Du Preez (1996:1) defines investigation of crime as being “a systematised search for the truth, with the primary purpose of finding a positive solution to the crime with the help of objective and subjective clues”. According to Van der Westhuizen (1996:4), investigation takes place with definite objectives, which describe a commitment that must be achieved within an appointed time, and keeping a specified standard in mind.

The objectives of investigation are identification of the crime, gathering of evidence, individualisation of the crime, arresting of the suspects, recovery of stolen property, and involvement in the prosecution process (Van der Westhuizen, 1996:4). The theft of PGMs tends to occur above ground during one of the recovery processes in the refinery. Impala Platinum mines and refinery have four complicated recovery processes for PGMs (Anon, 2013).

### **3.14 CONCLUSION**

This chapter focused primarily on a general outline of the theft of Platinum Group Metals (PGMs) in South Africa – in particular in the mining producing industry. It dealt with the extent of theft of PGMs, the security RISK MANAGEMENT model that can be applied by Impala Platinum to enhance the fight against the crime, the organised crime threats, PMR processes, complicated recovery processes of PGMs, analysis of incident reports at Impala Platinum, criminal investigation techniques that can be used by Impala Platinum to investigate theft of PGMs, the role of PGMs in South Africa, and the organised crime syndicates involved in the theft in South Africa. The *modus operandi* of crime syndicates was also discussed. It is evident that although there are security measures in place, those measures are not effective

enough to prevent or reduce the incidence of the theft of PGMs. It is obvious that an improvement in the existing security measures is needed to ensure better protection of PGMs and greater prevention of their theft, as an identified risk, as well as a threat to the future operations and profitability of mining it.

Chapter 4 will deal with interpretation of data collected, the discussion thereof, analysis and comparison of research findings – with the purpose of making recommendations to enable the researcher to achieve the objectives and goals of the research study.

**CHAPTER 4**  
**DISCUSSION, INTERPRETATION AND COMPARISON**  
**OF RESEARCH FINDINGS**

**4.1 INTRODUCTION**

In Chapter 3, data were collected by utilising three separate questionnaires for Security Managers, Security Investigators and Security Officers – as well as one-on-one interviews with employees and contractors. The collected data were collated and analysed. A site visit was also conducted and during site visit, the researcher perused case dockets by making use of a case docket pro-forma analysis sheet. This chapter presents the findings of the research, in accordance with the methodologies applied – as mentioned in Chapter 2. In this chapter, the collected information will be interpreted, discussed and compared. This will be done with a view to making recommendations based on the aims and objectives of the research study.

**4.2 INTERPRETATION OF RESEARCH FINDINGS**

**4.2.1 Security managers' questionnaires**

***Biographical Details***

**a) Gender**

A total of 10 Security Managers responded to the questionnaires. All the respondents (100%) were male.

**Deduction:**

It is clear from the respondents that males occupy managerial positions, and women are not considered for such managerial positions. The disparity of gender equity in the mining industry is due to the fact that in the past, females were not employed in the security environment but rather in an administration environment. The managerial positions in the security environment are mostly offered to people who are more experienced (i.e. long-serving males) in the security industry.

**b) Age**

In terms of age, all respondents were 35 to 50 (100%). This is an indication of the age group of all respondents.

**Deduction:**

All the Security Managers were between 35 and 50. None of the respondents were younger than 35 years and it is an indication that younger Security Managers are considered to be too inexperienced to occupy managerial positions in the security industry – because of the associated responsibilities as well as being accountable. For example: a younger manager (34 and below), would find himself managing people who are older than himself, resulting in an uncomfortable or awkward scenario to cope with. The manager has to give instructions and guidance to his subordinates, and for the younger manager it might be a difficult situation and he may encounter resistance.

**c) Race**

In terms of race, all (100%) respondents were white.

**Deduction:**

Managerial positions are occupied and dominated by whites only in the mining industry – in particular in Impala Platinum mines and refinery. It is clear that employment equity has not yet being complied with and it would also appear that experience in the field was prioritised above any other requirements. In terms of the employment equity, previously disadvantages people has to occupy 75 per cent of the managerial positions across the spectrum than the white counterparts.

**d) Marital Status**

In terms of marital status, all (100%) respondents were married with families.

**Deduction:**

It can be concluded that all the respondents had wives and children. They are classified as family men with family responsibilities. Seven of the respondents had two dependents and three respondents had one dependant each. When taking into consideration the age group (35 and older) of the respondents, it is a distinct possibility that at their age, they would be married with children.

### **e) Highest Educational Qualification**

In terms of highest educational qualification, five (50%) respondents had Standard 10/Grade 12 and five (50%) had a three-year diploma/degree.

#### **Deduction:**

Of all the respondents, five had attained Grade 12 as their highest educational qualification. However, five had a three year diploma/degree. The five respondents that attained tertiary qualifications ranged from a Diploma in Policing/Security Management to a BTech degree in security management and/or policing. The respondents with standard 10/grade 12 are more experienced than the ones with diploma/degree and have long time service in security environment. It would appear that a tertiary qualification is not an absolute prerequisite for the managerial position – but rather management experience. Some of the respondents with standard 10/Grade 12 indicated that they had attained security management certificate short course (Short Learning Programme (SLP) through UNISA, which it is not deemed as a formal accredited tertiary qualification.

### ***Crime trends***

#### **a) In-house security or service provider**

In terms of the in-house security or service provider, five (50%) managers are in-house security and five (50%) managers are the service provider.

#### **Deduction:**

It is clear that managerial positions are occupied by the in-house security as well as the service provider (Bidvest Protea Coin). The service provider provides security services that entails security managers, security officers and investigators. The service provider employed 160 members including administration staff and has been the service provider for the past 18 years. The in-house security oversees that the service level agreement is complied with and give assistance whenever needed. The service provider management reports to the Group Protection Services Manager at Impala Platinum.

### **b) Prevalence theft of PGMs**

All (100%) respondents agreed that theft of PGMs was experienced by Impala Platinum.

#### **Deduction:**

The respondents also agreed that theft of PGMs was committed by employees, contractors and security officers (Level one operatives). According to the respondents, there is a dedicated investigations team that deals with the theft of PGMs. From the responses it is clear that the respondents had different opinions in terms of syndicates operating in the refinery, as well as the involvement of management with regards to theft. They indicated that money is a major contributing factor to the theft of PGMs. The respondents further indicated that theft of PGMs is the main problem experienced at the refinery.

### **c) Theft of PGMs, a challenge to mining industry**

In terms of challenge, all (100%) respondents stated that theft of PGMs is a challenge to the mining industry as a whole including Gold and Diamond mines.

#### **Deduction:**

They agreed that production loss, the *modus operandi* of criminals, the underworld market outside the mining industry, as well as demand of PGMs by national and international levels (levels four and five) – are challenges facing the mining industry. The chamber of mines and the mining industry has established a Standing Committee on Security and they meet regularly to deliberate on challenges facing the industry. The SAPS Organised Crime Unit in conjunction with the mining industry has also established a Provincial Operational Committee to discuss way forward in terms of the theft of PGMs. They all stated that theft of PGMs has a negative impact in the mining industry.

### **d) Relationship with National Prosecuting Authority regarding theft of PGMs**

Five (50%) responded by stating there is a good work relationship, three (30%) said it was bad and two (20%) did not respond.

**Deduction:**

Although responses differed, it can be concluded that there was a little co-operation from the NPA and the work relationship needs to improve for the betterment of the industry and to serve as a deterrent. The success rate in terms of convictions has to improve and jail imprisonment has to be imposed, in order to send a strong message to the crime syndicates that crime does not pay. The response from the participants indicate that the work relationship between the NPA, SAPS and the mining industry need to be strong and intact at all times to overcome theft challenges in the mining industry.

**e) SAPS Organised Crime Unit members' involvement in corruption**

The respondents all (100%) responded by indicating that some members of the SAPS Organised Crime Unit are involved in corruption/criminal activities.

**Deduction:**

Form the respondents, it is clear that members of the SAPS Organised Crime Unit are involved in corruption and/or illegal activities. It was established that the members will conduct a poor investigations which will result in cases being withdrawn at the courts, cause the disappearance of case dockets, evidence and exhibits, not informing complainants and witnesses regarding trial dates, swap exhibits of high value with lower value, and also visit the accused at their places of residence to extort money from them.

**f) Exportation of stolen product**

In terms of stolen products being exported, they all (100%) agree that the product is being exported.

**Deduction:**

The respondents all agreed and stated that the stolen material is exported. Four of the responded mentioned that Belgium is the destination for the stolen material, while other four said that Russia is the most prominent country where the material is exported and two said that neighbouring countries Zimbabwe is the country that is being used by the syndicate to export the material to the international destination.

**g) Security awareness programme**

The nine respondents (90%) indicated that security awareness programmes are in place – while one (10%) respondent said this was not the case.

**Deduction:**

Although one responded negatively, it is clear that security awareness programmes are in place and are promoted in different ways such as security induction, monthly flyers with regard to crime, as well as policies and procedures. It can be concluded that although the majority agrees that security awareness is in place and working, the employees and the contractors do not take the awareness into consideration when one look at the crime committed and loss the company incurred in the past 11 years. It would appear that the programme in place is not effective and efficient as supposing.

**h) Screening of security applicants before employment**

In terms of screening, all (100%) respondents indicated that a screening process is always followed.

**Deduction:**

They all agreed that a screening process for security applicants is always complied with before employment is considered. The applicant's qualifications and the criminal record will be verified through the SAPS. They also agreed that assessment of security officials is conducted periodically, every six months. The assessment of security officials is done through polygraph tests. In an event that the security officer polygraph test indicate deception, such particular officer will be removed from being deployed in the refinery.

***Security measures***

**a) Security measures in place**

In terms of security measures, all (100%) respondents stated that security measures are in place.

**Deduction:**

It is clear from the respondents that security measures such as security fences, CCTV cameras, security officers, access control and alarm intrusion systems are in place and always in working condition. According to the responses security measures in place are effective. CCTV cameras are in operation 24/7, and are monitored from the control rooms by nine security members per 12-hour shift. From the statistics obtained from the refinery, it is clear that the security measures in place are manipulated by the employees, contractors and security officers who are involved in the theft of PGMs. It would appear that the collusion between the employees, contractors and security officers is working in their favour if one has to take into consideration the amount of PGMs being stolen without being detected by the security measures in place.

**b) Security systems' maintenance**

In terms of security systems' maintenance, all (100%) respondents stated that security systems are regularly maintained.

**Deduction:**

From the respondents, it is clear that they all agree that the maintenance of the security system is maintained at all times. The responses indicated that the service provider maintain the system regularly, however, eight of the respondents stated that maintenance is done on a daily basis, while two stated that maintenance is done on a weekly basis. Although the respondents differ on the maintenance schedule, it is clear that the security system is maintained at all cost.

**c) Security procedures and policies**

In terms of security procedures and policies, all (100%) respondents stated that security procedures and policies are in place.

**Deduction:**

All respondents stated that security procedures and policies are in place and that employees and the security officers are familiar with the contents thereof. Audits are done and copies of the procedures and policies are kept at Document Control department in the company. The procedures and policies need to be more detailed

that will give guidelines to the employees and security officers in terms of the breach thereof. From the responses, it would seem that the procedures and policies in place are not detailed and they need to be reviewed to enhance effectiveness of them.

#### **4.2.2 Security investigators questionnaires**

##### ***Biographical details***

##### **a) Gender**

In terms of gender, twenty (100%) of the participants responded. According to gender – 15 were males and five were females.

##### **Deduction:**

It is clear that most of the investigators at the refinery are males and they dominate in the field of the security investigations. The reason could be that previously, more males were employed in the mining industry than females – in particular in the Security/Protection Services department. The majority of the investigators were previously employed in the SAPS as male detectives as compared to females who were previously employed as administration staff while being a police woman.

##### **b) Age**

In terms of age, all (100%) responded and according to age, 15 (75%) were between 30-50 years and five (25%) were older than 50 years.

##### **Deduction:**

Most of the security investigators were aged 30-50 years. Although five respondents were older than 50 years, it indicates that experience plays an important part in a work situation. The investigations would need somebody who is mature and ready to make/take decisive decisions. It would appear that the respondent's ages plays an important role in the investigations and younger employees might compromise the investigations skills in a department in the refinery.

##### **c) Race**

In terms of race, all (100%) respondents were white as the vast majority.

**Deduction:**

It is clear that there is no racial representation in the refinery and only whites are employed as the investigations officers. It could be that experience again is considered when deploying officials for investigation purposes. Most of the blacks from the service provider and in-house security are deployed as the guards and perform patrols duties, monitoring of CCTV cameras and conducting individual searches to employees and contractors.

**d) Marital Status**

In terms of marital status, 18 (80%) of the investigators were married, one (10%) was divorced, and one (10%) was a widow.

**Deduction:**

It can be concluded that most of the respondents had wives and dependents to look after. Of the 20 respondents, 12 had two dependants, and eight had one dependant. Although one respondent is divorced and one a widow, the two were married. The marital status in an organisation plays an important role as the employees always act responsibly and this could be the case with the security investigators employed in the refinery.

**e) Highest educational qualifications**

All (100%) responded to the question about highest educational qualifications. Of the 20 (100%) respondents, 16 had Standard 10/Grade 12 and four had a three-year diploma/degree.

**Deduction:**

The highest educational qualification attained by most respondents is Standard 10/Grade 12, while only four had three-year diploma/degree. It would seem that tertiary qualifications are not a prerequisite for investigation positions. The most important requirement is the experience that an individual possess. It would appear that most of the respondents have more than ten years of work experience and the investigation skills in the field of work. The investigations technique should be required for the position of an investigator.

## ***Crime trends***

### **a) Problems of theft of PGMs**

All 20 (100%) responded by indicating that they experience theft of PGMs in the refinery.

#### **Deduction:**

The respondents agreed that Impala Platinum experiences problems with theft of PGMs and that the people involved in the theft are employees and contractors. Although security members were not mentioned, it came to light that security members were also involved in the theft of PGMs. It also emerged that suspects involved in the theft were known to the investigators. From the statistics obtained during the site visit by the researcher, it is clear that security officers colluded with the employees and contractors in the theft of PGMs.

### **b) Motivation for criminals**

In terms of motivation for criminals, 20 (100%) responded and they all mentioned money as being a motivator and the opportunity to commit theft.

#### **Deduction:**

According to the respondents, criminal syndicates consider money as a motivating factor to commit crime and the opportunity to commit theft of PGMs. The respondents stated that theft is committed on a daily basis by the syndicates that include employees, contractors and security officers. The security systems in place are monitored by the security officers colluding with criminal elements in the refinery. The PGMs are accessible to the employees and that motivate them to commit theft and involve contractors and security officers.

### **c) Theft of PGMs: A challenge**

In terms of theft of PGMs being a challenge, all (100%) responded that the theft of PGMs is a challenge to the mining and refining industry.

#### **Deduction:**

They all agree that theft of PGMs in the mining and refining industry is a real challenge – by mentioning production loss, demand of the product by syndicates

(levels two – five), promotion of the underworld market, and opportunities for the syndicates (level one) to steal the product from the place of origin. The theft of PGMs is syndicate-driven and the manner in which the product is stolen is through rectum parcels hidden inside the body of individuals in the refinery. According to the investigators, they have not had a case where confession was made by suspects during arrests.

**d) Relationship with SAPS Organised Crime Unit**

In terms of the relationship, eight (40%) of the respondents indicated that the relationship is good, eight (40%) indicated a bad relationship, while four (20%) did not respond.

**Deduction:**

The respondents' responses were different with regards to the work relationship with the SAPS Organised Crime unit. It was also indicated by the respondents that members of the Organised Crime Unit are involved in corruption or criminal activities. Their involvement in corruption/criminal activities occurred as a result of poor investigations, exchange of high value exhibits with lower value exhibits, the disappearance of exhibits and case dockets, and the failure by the SAPS investigator to inform complainants and the witnesses regarding trial dates. Not all the members of Organised Crime Unit can thoroughly investigate theft of PGMs and Precious stones

**e) Theft of PGMs has a negative impact on mining and refining**

The respondents (100%) indicated that theft of PGMs does have a negative impact on mining and refining.

**Deduction:**

The responses indicated that it is obvious that theft of PGMs will have a negative impact on mining and refining – since there is loss of production, promotion of an underworld market, and customers might decide to do business with the underworld market – since the stolen product can be bought at a cheaper price than what the legitimate product can be bought for from the mine and/or refinery. Theft has direct

influence on the future existence, expansion and the profitability of the mines and refinery.

**f) Relationship with National Prosecuting Authority**

All the respondents (100%) stated that the relationship with the NPA regarding the theft of PGMs is bad.

**Deduction:**

It can be concluded that the work relationship between investigators and the NPA is unhealthy – if one looks at the responses of the respondents. It also came to light that the success rate of convictions was only fair, suggesting that the relationship could be bad as was indicated by the respondents. The successful work relationship will be determined by the successful convictions of those involved, followed by the sentence that reflect the gravity of the offence that ruthlessly undermine mining and refining industry. Unless the criminal syndicates are convicted and sentenced appropriately, all the hard work lives risked to expose the offenders will be in vain.

**g) Intelligence network**

In terms of the intelligence network, it is clear that investigators (100%) make use of it to collect and gather information with regard to theft of PGMs.

**Deduction:**

It is clear from the respondents that informers are there to help with information regarding the theft of PGMs. Although theft occurs, investigators rely on informers to provide them with information about when theft is committed, how it is done, and by whom. Crime syndicates need to be investigated by utilising undercover projects where agents infiltrate the syndicate. The investigating techniques will attempt to eradicate criminal elements at the source (level one) and terminate the trafficking in illegal and stolen PGMs.

**h) Individuals caught stealing**

In terms of individuals who are caught stealing, twenty (100%) respondents stated that they are arrested and handed over to the SAPS.

**Deduction:**

Respondents indicated that the arrested individuals are charged departmentally, where a disciplinary enquiry is held – and if found guilty, such an individual will be dismissed. The person arrested will be interviewed by the investigators to determine their involvement in the theft of PGMs. The exhibit found on an individual will be confiscated, weighed, have photos taken in the presence of the suspect and then be handed over to the SAPS for further investigation and prosecution. The co-operation between the security investigators, SAPS and NPA is very important in a situation where an individual or group of people are caught stealing and it is where the work relation has to be strong to eradicate criminal elements.

**i) Exportation of stolen product (PGMs)**

In terms of exportation of PGMs, all (100%) agreed that the stolen product (PGMs) is exported internationally.

**Deduction:**

Based on the response of the participants, it can be concluded that the stolen product is exported internationally to countries such as Russia, Belgium and United Kingdom. The PGMs are exported via Zambia to international operatives (level five) and are smuggled in large quantities. The export of PGMs will take place by air and shipment to the international destination with false description of the product as well as under-declaration of its value.

**j) Criminals working alone or in groups**

In terms of criminals working alone or in groups, all (100%) respondents stated that criminals work in groups – meaning syndicate-driven.

**Deduction:**

Although the rectum parcels as *modus operandi* are removed by individuals (level one) from the source, it is actually syndicate-driven since the stolen product will then be handed over to an individual(s) outside the refinery (level two) that is/are part of a particular crime syndicate. Males and females irrespective of gender older than 18 years are involved in the syndicates and theft of PGMs. There are no ethnic group

components in the crime syndicates and the ultimate goal of the syndicate is to smuggle PGMs to enrich themselves.

### ***Security measures***

#### **a) Security measures**

In terms of security measures, 20 (100%) respondents stated that there are security measures in place at Impala Platinum.

#### **Deduction:**

In accordance with the respondents, it is common that security measures are in place and that they are very effective. CCTV cameras are monitored 24/7 from the control room by nine security officers. Any irregularities observed on the monitors are reported to the investigators. From the statistics obtained by the researcher, it would appear that the existing security measures as indicated by the respondents are not effective when taking into consideration theft of PGMs committed by employees, contractors and security officers. The vulnerabilities of the security system in place were identified during the site visit.

#### **b) Security systems maintained**

In terms of the maintenance, 20 (100%) respondents stated that security systems are maintained regularly.

#### **Deduction:**

It is clear from the respondents that security systems are maintained regularly, and also on a daily basis. In terms of the Service Level Agreement (SLA) between Impala Platinum and the service providers, maintenance had to be done regularly and on a daily basis.

#### **c) Security procedures and policies**

In accordance with all (100%) respondents, security procedures and policies are in place.

**Deduction:**

The security procedures and policies in place are known by the employees and audits on them are done regularly by the designated employees. The employees are familiar with both procedures and policies. The policies and procedures are not detailed as supposing and it can be the shortcoming and causes of theft of PGMs in the refinery. The respondents could not say how effective are the policies and procedures but from the theft point of view, security officers and employees are not familiar with the contents thereof.

**d) Security awareness programme**

In terms of the security awareness programme, all (100%) respondents indicated that it is in place with regards to crime in general.

**Deduction:**

The security awareness programme in terms of crime and other security related issues is in place and promoted through security induction and security flyers on a weekly basis. All the employees are made aware of the consequences of being involved in crime and that they, as the employees, contractors and security officers have to report any suspicious behaviour of colleagues or any suspicious items to security – by making use of the toll-free number provided by the company.

**4.2.3 Security officers' questionnaires*****Biographical details*****a) Gender**

In terms of gender, of the sixty (100%) respondents, only 50 (90%) responded: 40 were males and 10 were females.

**Deduction:**

It is evident from the respondents that there are more male security officers employed than female security officers. One can infer that previously, a strongly male dominated in security industry. It is now that female had started to join the previously male dominated environment (Security Industry) and most of the female joining the industry were previously employed by SAPS.

**b) Age**

In terms of age, of the 60 (100%) respondents, only 50 responded: 40 were aged 19-50, and 10 were older than 50 years.

**Deduction:**

Most of the respondents were aged between 19 - 50 years. Most respondents are still young and some of them just completed Grade 12. The younger respondents have a career future in the security industry. The ten respondents were older than 50 years and 4 of them are heading for pension. The ten respondents are more experienced than the respondents aged 19-50.

**c) Race**

In terms of race (100%), 50 (90%) responded: 20 were white and 30 were black.

**Deduction:**

It is clear that racial representation prevails amongst the respondents. In terms of the employment of security officers, race is not an issue and one can conclude that employment equity is considered during employment. It would appear that the junior ranks in security are black dominated and they have no vast experience as compared to the white counterpart.

**d) Marital status**

In terms of marital status, 50 (90%) responded: 20 were married, 25 divorced/single, and five were widows/widowers.

**Deduction:**

Based on the responses, there were more divorced/single respondents than married ones. It is clear that from the married respondents, that they had families (wives and children) to take care of as compared to others (widows/widowers and divorced/single). Of the 50 respondents, 10 had one dependant, 20 had two dependants, and 20 had three or more dependants.

**e) Highest education qualification**

In terms of highest educational qualifications, of the 60 (100%), only 50 (90%) responded: 42 had Standard 10/Grade 12 and eight had a three-year diploma/degree.

**Deduction:**

Based on the responses, the highest qualification was Standard 10/Grade 12. However, eight respondents had a three-year diploma/degree. One can conclude that the pre-requisite for security officer positions was Standard 10/Grade 12, with a three-year diploma/degree being an advantage. The respondents work positions were Senior Shift Supervisors (SSS), Senior Security Officers (SSO), and Security Officers (SO). It would appear that most have one-nine years' work experience, while the others had more than 10 years of work experience.

***Crime trends***

**a) Prevalence of theft of PGMs**

Of sixty (100%) respondents, 50 (90%) responded and indicated that theft of PGMs is a problem.

**Deduction:**

From the responses, it is clear that Impala experienced problems with theft of PGMs. Respondents agreed that people involved in the theft are employees, contractors and security officers. Although respondents were reluctant to respond – from the research findings it was clear that contractors and security officers are involved in the theft of PGMs. It also emerged that of the 50 respondents, 15 knew the suspects, while 35 said suspects were unknown. The respondents that indicated that suspects are known to them were afraid to mention them.

**b) Motivation for criminals**

In terms of motivation for criminals, of the 60 (100%) respondents, only 50 (90%) responded and they indicated that money is a motivating factor.

**Deduction:**

According to the respondents, criminal syndicates consider money as a motivating factor to commit crime and the opportunity to commit theft of PGMs. The respondents stated that theft is committed on a daily basis by the syndicates that include employees, contractors and security officers. The security systems in place are monitored by the security officers colluding with criminal elements in the refinery. The PGMs are accessible to the employees and that motivate them to commit theft and involve contractors and security officers.

**c) Theft of PGMs – a challenge**

In terms of theft of PGMs being a challenge, 50 (90%) responded by indicating that theft is a challenge for Impala Platinum.

**Deduction:**

Although it was not asked from the respondents to elaborate on their responses, it is evident from the statistics that theft of PGMs is a challenge for the organisation. The respondents all agree that theft of PGMs in the mining and refining industry is a real challenge – by mentioning production loss, demand of the product by syndicates (levels two – five), promotion of the underworld market, and opportunities for the syndicates (level one) to steal the product from the place of origin (refinery). The theft of PGMs is syndicate-driven and the manner in which the product is stolen is through rectum parcels hidden inside the body of individuals in the refinery.

**d) Organised Crime Unit involvement in corruption/criminal activities**

In terms of involvement of members of the Organised Crime Unit, it was indicated by respondents (90%) – that they are involved.

**Deduction:**

From the responses it was established that their involvement results from poor investigations, exchange of high-value exhibits for lower value ones, the disappearance of exhibits and case dockets, and the failure to inform complainants and witnesses about trial dates. The respondents further stated that members of Organised Crime Unit visits accused persons at their residential places to extort money from them.

**e) Theft has a negative impact on mining and refining**

In terms of negative impact, of the 60 (100%) respondents, 50 (90%) said that theft has a negative impact on mining and refining.

**Deduction:**

It is obvious that theft has a negative impact since loss of production will emerge, promotion of underworld markets emerges which will result in customers buying from the underworld – and hence the price will be less than that in the legitimate market. Theft has direct influence on the future existence, expansion and the profitability of the mines and refinery.

**f) Individuals caught stealing**

In terms of individuals caught stealing, of the 60 respondents (100%), 50 (90%) said that they are arrested.

**Deduction:**

All the individuals arrested will be charged criminally and departmentally. The individual arrested will be handed over to the police for further investigations. The particular individual will be charged departmentally – where a disciplinary enquiry will be held. The exhibit found on the suspect is confiscated and handed over to the police for analysis and court purposes.

**g) Exportation of stolen product**

In terms of exportation of stolen product, of 60 (100%) respondents, only 50 (90%) responded that the stolen material is exported.

**Deduction:**

From the respondents it is agreed that the PGMs are exported to the international destination. Based on the response of the participants, it can be concluded that the stolen product is exported internationally to countries such as Russia, Belgium and United Kingdom. The PGMs are exported via Zambia to international operatives (level five) and are smuggled in large quantities. The export of PGMs will take place

by air and shipment to the international destination with false description of the product as well as under-declaration of its value.

#### **4.3 COMPARISON OF THE QUESTIONNAIRES OF SECURITY MANAGERS, SECURITY INVESTIGATORS AND SECURITY OFFICERS**

The comparison of these questionnaires is outlined below:

##### **a) Experience theft of PGMs**

All (100%) of the respondents indicated that Impala Platinum mines and refinery experience theft of PGMs.

##### **Deduction:**

It is clear from the respondents that theft of PGMs is a serious problem and has direct influence on the future existence, expansion and profitability of the mines and refinery. It is also clear that security measures in place are not effective as one would think. The collusion between employees, contractors and security officers with regard to theft is a challenge – and drastic measures should be introduced to eliminate the collusion between the employees, contractors and security officers.

##### **b) Organised Crime Unit involvement in corruption/criminal activities**

The respondents (100%) agreed that members of the Organised Crime Unit are involved in corruption/criminal activities.

##### **Deduction:**

All the respondents indicated the involvement of members in corruption/criminal activities. They stated that members of the Organised Crime Unit will always ask about the platinum when conducting investigations. They deliberately conduct poor investigations against suspects known to them, ensure the disappearance of case dockets, fail to inform complainants and witnesses about trial dates, exchange high-value exhibits with lower value ones and visit suspects at their places of residence. From the responses, it is indicated that money is received by members of the unit – to enrich themselves in a corrupt manner.

**c) Theft of PGMs has a negative impact in the mining industry**

The all three respondents went on to indicate that theft of PGMs has a negative impact in the mining industry.

**Deduction:**

It is indicated that loss of production occurred as a result of theft – suggesting a negative impact in the mining industry; losses of revenue to the industry also emerge, promotion of the underworld market rises, possible retrenchments of employees are contemplated, future existence come into play, the profitability of mines and refinery is incurred. PGMs are a national asset and in the North West Province, in particular, they form the pillars of the social and economic structure. The mining industry spend a lot of money on security to curb the theft but due to the nature of the PGMs process it is impossible to prevent theft from occurring and it impacts negatively.

**d) Exportation of stolen material**

The respondents agreed that stolen material is exported internationally.

**Deduction:**

The respondents indicated that the exportation of the material by crime syndicates is done via shipments and by air. They will use cement bags to ship the stolen material – which would look legitimate, just like cement being exported. The exportation of the stolen material can be in convertor matte, salt format, or in the final stage of the material. The syndicates will falsify the description of the product as well as an under-declaration of its value. They are all in agreement that PGMs are exported via Zambia and Zimbabwe in our neighbouring countries to the international destination such as United Kingdom, Switzerland, Russia and Belgium.

**e) Relationship with National Prosecuting Authority**

All three respondents indicated differently in terms of the relationship with the NPA regarding the theft of PGMs is bad.

**Deduction:**

It can be concluded that the work relationship between respondents and the NPA is unhealthy – if one looks at the responses from the respondents. It also came to light that the success rate of convictions was only fair, suggesting that the relationship could be bad as was indicated by the respondents. The successful work relationship will be determined by the successful convictions of those involved, followed by the sentence that reflect the gravity of the offence that ruthlessly undermine mining and refining industry. Unless the criminal syndicates are convicted and sentenced appropriately, all the hard work lives risked to expose the offenders will be in vain. It very important to ensure that relations between the respondents and the NPA is always intact to fight the theft of PGMs in the mining and refining industry.

**4.4 STATISTICAL COMPARISON OF THE QUESTIONNAIRES OF SECURITY MANAGERS, SECURITY INVESTIGATORS AND SECURITY OFFICERS**

The research findings in this chapter deal with statistical comparison between the three responses in the questionnaires from security managers, security investigators and security officers. The statistical comparison included only common aspects which were researched in all three questionnaires – and they were all open-ended questions.

**4.4.1 Open-ended questions**

For comparison of the participants via open-ended questions for security managers, security investigators and security officers – the following standard questions were asked of all three sets of respondents:

- Do you experience any problems regarding theft of Platinum Group Metals (PGMs) at Impala Platinum mines and refinery;
- Who do you think is involved in the theft of PGMs;
- What do you think motivates criminals to steal PGMs;
- How often do you think theft is committed at Impala Platinum mines and refinery;

- Do you think theft of PGMs is a challenge to the mining and refining industry;
- Do you think SAPS Organised Crime Unit members are involved in corruption/criminal activities relating to PGMs;
- Does theft of PGMs have any negative impact in the mining industry; and
- Do you think that the stolen material (PGMs) is exported internationally?
- What are the underlying reasons for the theft of PGMs?
- What is the modus operandi used in the theft of PGMs?
- What are the causes of theft of PGMs at Impala Platinum?
- What is the extent of the losses suffered by Impala Platinum?

The following paragraphs will indicate the comparison between the responses from the three sets of respondents – followed by a discussion of each compared question.

**Table 4.1: Did you experience any problems regarding theft of PGMs at Impala Platinum mines and refinery?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes	Yes

**Discussion:**

All the respondents indicated yes to problems experienced by Impala Platinum mines and refinery with regard to the theft of PGMs. All the questionnaires delivered to the respondents were received back with the same response and that indicated that theft of PGMs is a serious problem to Impala Platinum mines and refinery – as well as to other PGMs-producing industry. The demand of PGMs by the underworld makes the company to encounter problems with the theft and the employees as well as the security officers who are supposed to look after the company assets are the ones involved in the criminal activities.

**Table 4.2: Who do you think is involved in the theft?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Employees	Employees	Employees
Contractors/Security Officers	Contractors/Security Officers	Contractors/Security Officers

**Discussion:**

The responses from the respondents are similar – indicating that employees, security officers and contractors (level one operatives) are the people involved in the theft of PGMs. It also emerged that employees are the people who have access to the product (PGMs) – since they work with the material on daily basis. They (employees) then remove the material from the place of origin (refinery) and take it out of the refinery (stealing) – or they hand the material to the contractors or security officers to take the material out of the plant (stealing) without being noticed. The employees, security officers and contractors will meet outside the boundaries of Impala Platinum, where the material will be handed over to the employees in exchange for the money promised by the syndicates (level one). The employees/syndicates will then sell the stolen material to the runners/illegal smelters, who they will in turn sell the material to the organised-crime syndicates (level three – five).

**Table 4.3: What do you think motivates criminals to commit theft of PGMs?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Money/Greedy	Money/Greedy	Money/Greedy
Underworld market	Underworld market	Opportunity
Demand of PGMs	Opportunity	

**Discussion:**

The respondents stated that money is the main motivating factor for the employees and contractors to steal PGMs. Security managers and security investigators also indicated that there is an underworld market out there and that it is very easy to sell

stolen material to the underworld market. Security managers further indicated that PGMs are in demand outside the illegitimate market. From the security investigators and security officers, it can be concluded that opportunity to steal can also be a motivational factor driving syndicates to steal PGMs.

**Table 4.4: How often do you think theft is committed at Impala Platinum mines and refinery?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
2 x per week	Daily	Daily
Other		

**Discussion:**

This question was answered differently by the respondents, although security investigators and security officers agreed that theft of PGMs is committed on a daily basis. Security managers stated that theft is committed two times per week. Security investigators and security officers are physically on hand when it comes to prevention of crime or protection of company assets. They might be correct to say that theft of PGMs is committed on a daily basis.

**Table 4.5: Do you think that theft of PGMs is a challenge to the mining and refining industry?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes	Yes

**Discussion:**

They all agree that theft of PGMs in the mining and refining industry is a real challenge – by mentioning production loss, demand of the product by syndicates (levels two – five), promotion of the underworld market, and opportunities for the syndicates (level one) to steal the product from the place of origin. The theft of PGMs is syndicate-driven and the manner in which the product is stolen is through rectum parcels hidden inside the body of individuals in the refinery. Theft also affects the economy of the country since no tax revenues are paid by the crime syndicates and the shareholders of the mining industry are also affected by the theft.

**Table 4.6: Do you think SAPS' Organised Crime Unit members are involved in corruption/criminal activities relating to PGMs?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes	Yes

**Discussion:**

All the respondents agreed that members of the SAPS Organised Crime Unit are involved in corruption/criminal activities. All the respondents indicated the involvement of members in corruption/criminal activities. They stated that members of the Organised Crime Unit will always ask about the platinum when conducting investigations. They deliberately conduct poor investigations against suspects known to them, ensure the disappearance of case dockets and exhibits, fail to inform complainants and witnesses about trial dates, exchange high-value exhibits with lower value exhibits, fail to send PGMs to the laboratory for analytical purposes and visit suspects at their places of residence to extort money. From the responses, it is indicated that money is received by members of the unit – to enrich themselves in a corrupt manner.

**Table 4.7: Does theft of PGMs has a negative impact in the mining industry?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes	Yes

**Discussion:**

The respondents answered in the affirmative to this question. They stated that loss of production as result of theft has a negative impact on the mining industry. It is indicated that loss of production occurred as a result of theft of PGMs – suggesting a negative impact in the mining industry; losses of revenue to the industry also emerge, promotion of the underworld market rises, possible retrenchments of employees are contemplated, future existence come into play, the profitability of mines and refinery is incurred. PGMs are a national asset and in the North West Province, in particular, they form the pillars of the social and economic structure. The

mining industry spend a lot of money on security to curb the theft but due to the nature of the PGMs process it is impossible to prevent theft from occurring and it impacts negatively.

**Table 4.8: Do you think that the stolen material (PGMs) is exported internationally?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes	Yes

**Discussion:**

The respondents agreed that the stolen material (PGMs) is exported internationally. The organised crime syndicates use shipments as a way of exporting the stolen material. They export the stolen material disguised as either bags of cement or container of coffee, which will seem legitimate to authorities at harbours. The other way of exporting PGMs is through airport. They will use cement bags to ship the stolen material – which would look legitimate, just like cement being exported. The exportation of the stolen material can be in converter matte, salt format, or in the final stage of the material. The syndicates will falsify the description of the product as well as an under-declaration of its value. They are all in agreement that PGMs are exported via Zambia and Zimbabwe to the international destination such as United Kingdom, Switzerland, Russia and Belgium.

**Table 4.9: Are the underlying reasons for theft of PGMs?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes	Yes

**Discussion:**

All respondents agreed that the underlying reasons for the theft of PGMs is the opportunity, greediness, money and demand of PGMs by the underworld. They also agreed that the crime syndicates enrich themselves by committing theft of PGMs. The other exploitation could be that the security officers, who are supposed to

prevent theft from being committed are colluding with the employees and the contractors, and that they are aware that the security measures in place are ineffective. The metal detector used by Impala is ineffective and cannot detect PGMs when in a salt format since it only activates if the material is in a metal form.

**Table 4.10: Is there modus operandi used in the theft of PGMs?**

<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes

**Discussion:**

The respondents (security investigators and officers) all indicated that the modus operandi of the syndicates is similar in that they will place the PGMs in a plastic bag and use a tape to wrap the material in a rectum parcel form and hide the material in their body orifices. They will also use surgical gloves to place the PGMs and hide the material in their body orifices. The metal detector will fail to detect the hidden PGMs and they will remove the PGMs without being detected.

**Table 4.11: Are there any causes of theft of PGMs from Impala Platinum?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes	Yes

**Discussion:**

The respondents all agreed that the security measures in place that are not effective could lead to the causes of theft of PGMs. The co-operation from the employees, contractors and security officers could also be a contributing factor to the theft of PGMs. The respondents indicated that it would seem that the PGMs are easily accessible to the employees since they are working with the material on a daily basis thus making it easy to commit theft of the PGMs. The opportunity and the money could also be the causes of theft of PGMs.

**Table 4.12: Is there an extent of losses (product and financially) suffered by Impala Platinum?**

<b>Security Managers</b>	<b>Security Investigators</b>	<b>Security Officers</b>
Yes	Yes	Yes

**Discussion:**

The respondents (security managers and investigators) indicated that the extent of losses suffered by the company amounts to millions although they could not give an exact amount but it's over and above R20 million for the period 2004-2014. From the statistics obtained from Impala where the material was recovered, it is clear that the company losses incurred amounts to millions per annum.

**4.5 COMPARISON OF EMPLOYEES' AND CONTRACTORS' INTERVIEWS**

The findings also deal with matters for comparison of the interviews between employees and contractors. The same interview schedule of questions was utilised by the researcher for employees and contractors and they were open-ended and mostly open-ended nominal questions. All the interviewees agreed that theft of PGMs is a challenge to Impala and other mining industries. The seven interviewed permanent contractors also agreed that causes of theft is opportunity, greediness and enrichment by the crime syndicates operating from the refinery. Some of the employees and contractors agreed that there is a collusion with security officers to steal PGMs from the refinery.

The employees and contractors also agreed that the PGMs are stolen in the form of salt and are removed from the refinery in a rectum parcel format. From the statistics obtained, the researcher is of the opinion that employees are the most influential syndicates in the hierarchy level of crime syndicates and plays an important role as employees have access to the PGMs in the refinery and work with the PGMs on daily basis.

The employees and contractors responded that security officers and some employees work together to steal PGMs and that they also use contractors to

remove the product from the plant in the refinery. The theft of PGMs is syndicate-driven and they indicated that Impala employees are the people who have access to the product. The employees remove the product from the place of origin in the refinery where parcels containing PGMs are manufactured – before these are removed from the plant in the refinery.

They all agreed that money and greed plays an important role in the lives of the crime syndicates as they are used to live luxury at the expense of the refinery. Some of the employees and contractors agreed that opportunity to commit theft of PGMs is also a contributing factor to the loss of assets to Impala Platinum.

The respondents agreed that syndicates (employees) provide families of the security officers and/or contractors with money in the case where one of their members is arrested. The respondents further indicated that crime syndicates within the refinery are so organised and co-operative in their unlawful activities, meaning that they carefully look after each other.

#### **4.6 FINDINGS OF METHOD OF PROTECTION**

- It was found that Impala has outsourced security to Bidvest Protea Coin as the service provider, which company has deployed security officers in the refinery. These security officers' tasks are to conduct detailed individual searches, patrol in the refinery, and escort the PGMs to the airport. It was established that some of the security officers are colluding with crime syndicates (Employees and Contractors) to remove PGMs from the refinery. The security officers involved fail to conduct detailed individual searches to employees and contractors exiting the refinery.
- The metal detectors are utilised by security officers to conduct detailed individual body searches of all employees, contractors and security exiting the refinery. The main objective of the metal detectors is to detect foreign objects (PGMs) either inside or on the bodies of employees, contractors and security officers exiting the refinery. It was found that the metal detectors are ineffective and cannot detect

foreign objects (PGMs) in salt form inside the body of an individual during searches. It was established that the metal detector only activates if a pure metal (PGMs) is detected inside the body of an individual and not if the PGMs are in a salt form (yellow substance).

- Policies and procedures in place serve as operational guidelines to all in the refinery. They form part of a comprehensive security plan which the security service provider employees need to implement, manage and monitor while ensuring that employees and contractors adhere to them. It was found that the policies and procedures in place do not indicate properly how searches should be conducted on individuals exiting the refinery.
- There are two ways of promoting security awareness in the refinery being distribution of security flyers and presenting inductions to employees and contractors. From the statistics obtained by the researcher, it is his opinion that the security awareness in place is ineffective if one has to take into consideration the theft of PGMs committed for the period 2004 – 2014.
- There are more than 500 CCTV surveillance cameras installed that cover strategic and high risk areas in the refinery. There are also CCTV surveillance cameras inside the search cubicle and all these cameras are monitored from the two control rooms. There is a Third Tier (Control room) which oversees both control rooms to ensure that CCTV surveillance cameras are effectively monitored. It was found that the CCTV surveillance cameras footages are also used for the investigations purposes during internal disciplinary enquiries and for prosecution.
- The access control is in the form of turnstiles in most areas in the refinery, where one has to swipe his/her access card before entering or exiting the area. The refinery make use of access cards (proximity cards) to employees, contractors and security officers to access area of work, to identify its employees as well as the contractors (KMA Workforce, LADS construction and Bidvest Protea Coin) and those access cards are also used to report on/off duty. The person issued

with the card is responsible for it and it should be kept in his/her possession at all times in the refinery.

#### **4.7 FINDINGS OF IMPALA MINES' CASE DOCKETS ANALYSIS**

For this research study, the researcher selected 120 case dockets from a 500 case docket target population of Impala Platinum mines and refinery that were reported for further investigation. The researcher made use of the case docket analysis pro-forma. The purpose of the case docket analysis pro-forma was to determine the day, time, location when the theft was committed, the type of product stolen, the value stolen, and the *modus operandi* of criminals. The process of the pro-forma was also to obtain information in relation to arrests, disciplinary hearings and criminal convictions of the accused. Of the 120 reported case dockets, 90 were finalised, closed and filed by Impala Platinum.

The 90 filed case dockets were perused by the researcher, and according to the analysis, suspects were found in possession of PGMs. The suspects were charged with Theft and Possession of Suspected PGMs. The other 30 case dockets were still on the court roll and pending, but were also perused by the researcher. The pending case dockets resulted from an outstanding analysis report from the SAPS laboratory. The PGMs recovered by the investigators were mostly platinum in a salt format (yellow substance) – which according to the investigators cannot be detected by the metal detectors used by Impala Platinum. The weight varies for individual PGMs, as well as the values.

All the cases where the employees, contractors and security officers were arrested disciplinary actions were instituted and perpetrators were dismissed for dishonesty. In criminal court cases some perpetrators pleaded guilty and, suspended sentences or fines were imposed against them, whereas in the cases where trial was conducted, some were found guilty with minor sentences imposed and/or sentences wholly suspended without jail term.

In some instances, the accused persons were sentenced to imprisonment with an option of a fine and fines will be paid in order to avoid being sent to jail. The accused persons were males and females that included employees, security officers, and

contractors. In case where the accused persons pleaded guilty, he/she is found guilty and suspended sentences were imposed on the accused by a court of law.

#### **4.8 CONCLUSION**

The survey questionnaires, which were distributed for the security managers, security investigators and security officers at the refinery were statistically presented. Every question was dealt with from the three questionnaires. Responses from all open-ended and nominal questions from security managers, security investigators and security officers were analysed, where the internal and external threats were identified as a result of the responses sourced from the participants.

The interviews of the employees and contractors at the refinery were also statistically presented. Each question from the interview schedule was analysed - and weaknesses with regard to security measures in-place were identified. Most of the answers from the respondents were similar. The employees and contractors agreed that theft of PGMs is a challenge to Impala Platinum and others in the mining industry and that security officers, employees and contractors are in collusion in the theft of PGMs.

This chapter dealt with data analysis, a statistical report, data comparison and research findings. Chapter 5 will focus on recommendations and the conclusion, and the implementation of the recommendations. The recommendations will be of important to Impala Platinum mines and refinery and others in the platinum-producing industry, and will also help to improve current security measures in place.

## **CHAPTER 5**

### **RECOMMENDATIONS AND CONCLUSION**

#### **5.1 INTRODUCTION**

In Chapter 1, the motivation for the research and the problem statement were discussed. Chapter 2 presented the research methodologies used during the research. Chapter 3 contextualized the challenges facing Impala and other mining industries – with regard to the theft of PGMs, and identified the levels of criminal syndicates and the *modus operandi* of criminals. It also indicated the people involved in the theft of PGMs as employees, and reviewed some of the information, findings and recommendations from other sources dealing with the implementation of effective security measures for the prevention of theft of PGMs at Impala Platinum – and possibly at other mining industries in South Africa. In Chapter 4, the findings of the research were presented, in accordance with the methodologies applied and mentioned in Chapter 2.

This chapter focuses on the recommendations – based on the aims and objectives of the study – and presents the conclusion with regard to the betterment of security measures identified during the research study.

#### **5.2 RECOMMENDATIONS**

The recommendations made will be as a result of the research findings. The findings based on the method of protection, *modus operandi*, crime syndicates categories, and docket analysis are combined to enable the researcher to provide a comprehensive security survey sheet. The security survey sheet as well as the notes on how security survey has to be approached was compiled based on Security Risk Management Model and it provided a security risk management approach to securing PGMs from being stolen. The security sheet consisted of checklist of the product, security measures and the location of the plants in the refinery. The main objective of conducting security survey is to identify and improve the level of protection in the refinery against the threat of theft of PGMs.

Emanating from the research findings, it was found that theft of PGMs is a challenge facing Impala Platinum refinery and mining industry – in particular in the platinum-

producing mines in South Africa. Based on the research findings, it was found that the security measures in place in the refinery are ineffective in preventing and protecting assets (PGMs) belonging to Impala Platinum. Emerging from the research findings and responses, the following recommendations are made:

### **5.2.1 Recommendations to the employer**

It is recommended that the following be considered and implemented:

#### **1. Policies and procedures**

There are a number of valid reasons for an employer to have written workplace policies and procedures in place. Such policies and procedures are useful documents to rely on when a legal dispute arises between the employer and employee. It is thus vital for Impala Platinum to have policies and procedures in place – since they are guidelines for both the employer and the employee on how things should be done in the organisation.

The policies and procedures in place need to be reviewed by all stakeholders and changes should be more detailed, and implemented to enhance the effectiveness of the policies and procedures. It is evident from the findings, that policies and procedures in place that are not detailed – and they need improvement. Once the amendments has been made, all the employers and employees must familiarise themselves with them.

#### **2. Pre-employment vetting**

This is the process of performing a background check on someone before offering them employment, and it can include checking criminal records, educational qualifications, and pre-employment polygraph testing.

#### **3. Screening of criminal records of prospective employees/contractors**

It is very important for an organisation to check the criminal records of prospective employees or contractors – to ensure that they do not have previous convictions. It will help the company to not employ individuals with criminal records related to dishonest activities.

It was found that the criminal-record screening process is not the norm at Impala Platinum mines and refinery. It is therefore recommended that the criminal-record screening process be implemented at the rest of the Impala operations and employees as well as contractors to be screened – to help prevent the company from employing individuals with criminal records.

#### **4. *Pre-employment polygraph testing***

Pre-employment polygraph tests should be utilised to verify the person's truthfulness in the workplace. Although there is no legislation to control the use of the polygraph test, it will help the organisation before employing individuals. The tests will ensure that the organisation:

- Prevent individuals prone to theft of employer's assets, but who have not been arrested, from being employed
- Prevent individuals getting employed via false pretences
- Prevent the infiltration of individuals organised by outside and inside crime syndicates
- Prevent dishonesty in those in a position of trust
- Prevent deliberate falsification of documents and lies regarding the true identity of particular individuals.

#### **5. *Routine evaluation polygraph testing***

From the research findings, it was established that only security members are evaluated periodically to establish their involvement in theft. It was also established that security members and employees work together to steal PGMs. It is recommended that all employees directly involved in working with the product should also be evaluated periodically – to establish their involvement in the theft of PGMs. Where an individual is found to be involved in theft after being evaluated, that particular individual should be transferred to a lower risk section – to eliminate potential criminal activities.

## **5.2.2 Recommendations on security measures**

Security measures are designed to deny unauthorised access to facilities, equipment, assets, and resources – and also to protect personnel and property from damage or harm such as theft, espionage, or terrorist attacks. Security measures involves= the use of multiple layers of inter-dependent systems which includes CCTV surveillance, security officers, access-control protocols, low-dose X-ray body scanning and many other techniques. The following security measures are recommended for implementation:

### **1. Security officers**

It was found that security officers are colluding with the employees and contractors (level one operatives) to steal PGMs from the refinery. The following recommendations are made:

- i. Physical security patrols, plant sweeps, random plant searches and locker searches should be conducted on a daily basis by senior security officers – including supervisors.
- ii. Security audits and risk assessments should be conducted on a regular basis to identify vulnerable areas and risk-areas.
- iii. Senior security officers should be employed at the high-risk area where the product originates, in order to enhance the effective protection of PGMs.
- iv. Rotation of security officers should be implemented to avoid complacency, collusion with crime syndicates (level one operatives), and also recruitment from the crime syndicates.
- v. An investigation team should improve the intelligence network and implement reward scheme to individuals report any illegal activities in the refinery regarding the theft of PGMs.
- vi. A security-awareness programme during inductions presentation should include the court convictions to serve as a deterrent to the employees,

contractors and security officers regarding criminal activities inside and outside the organisation.

- vii. The trust-work relationship should be improved with supervisors and employees – regarding reporting of criminal activities within Impala Platinum.
- viii. A toll-free number should be established and made known to enable employees to report any suspicious activities or any irregularities.

## **2. Access control**

Access control refers to the practice of restricting entrance to a property, a building, or a room – to authorised persons. This can be achieved by human and technological means such as access-control systems. These systems determine who is allowed to enter or exit, where they are allowed to exit or enter, and when they are allowed to enter or exit.

Access-control systems should be reviewed to limit access to employees working at the high-risk section where the product originates. To prevent unauthorised access to employees, it is recommended that fingerprint biometric measurement, be installed to determine the uniqueness of the fingerprint– which will give access to authorised employees only. It is also recommended that senior security guards be employed at the high-risk section, since it will then be difficult for the syndicate to recruit.

## **3. Closed Circuit Television (CCTV) surveillance systems**

The CCTV surveillance cameras are deemed to be one of the most effective crime-prevention measures in the security industry. From the research site visit, it was established that there are more than 500 CCTV cameras installed at Impala Platinum Refinery, and they are monitored 24/7 from the control rooms by security officers. The CCTV surveillance cameras are mostly placed in areas that are not high-risk.

The researcher considers that more CCTV cameras should be installed in high-risk areas where PGMs originate, and where employees perform their daily tasks when

dealing with the material. A dedicated team from security should be employed to monitor the proposed CCTV cameras (high-risk area) from the PMR plant. They should monitor the movements of the PGMs in the high-risk areas, as well as the movements of the employees – to detect any irregularities. The areas should be monitored 24/7, and any suspicious movements detected should be reported immediately, in order to enhance speedy reaction from management or the security department.

The following security survey aimed at:

- Examining the current state of security measures in place in the refinery with a view of identifying security weaknesses and vulnerabilities;
- Ensuring that the minimum security measures required by the refinery, legislation and by insurance companies are in place, in order to mitigate the security risk of theft of PGMs and be managed cost-effectively; and
- Identifying the new security risks in the current security measures in place at the refinery.

#### **4. Recommended security survey sheet**

<b>CONTROL ISSUE</b>	<b>YES</b>	<b>NO</b>	<b>COMMENTS</b>
<b>A TYPE OF PRODUCT</b>			
1. Platinum			
2. Rhodium			
3. Palladium & Other			
<b>B LOCATION</b>			
1. PMR			
2. BMR			
3. OTHER			
<b>C SECURITY MEASURES</b>			
1. Human Resources			

2. Control Room			
3. CCTV Surveillance			
4. Alarm Systems			
5. Turnstiles			
6. Search Cubicles			
7. Interlocking Doors			
8. Metal Detectors			
9. Policies & Procedures			
10. Security Awareness			
11. Burglar Proofing on Windows			
12. Security Gates			
13. Adequate Lighting			
<b>TOTAL YES ANSWERS</b>			
<b>TOTAL NO ANSWERS</b>			
<b>SECURITY WEAKNESS</b>			

As soon as the security survey is completed, the information obtained must be advanced and a security report must be compiled. The report will entails all weaknesses and vulnerabilities identified, and all must be calculated. The weaknesses must be prioritised and vulnerability be calculated.

##### **5. Low dose X-ray body scanner**

It was established that Impala Platinum utilises hand-held body scanners to conduct detailed individual body search on employees, contractors and security officers exiting the PMR plant in the refinery. It was also established that security officers conduct hand body searches on employees, contractors at certain areas, without using the hand-held metal detectors. This method of searching is ineffective, since the statistics indicate that theft of PGMs occurs periodically and that employees, contractors, and security members are the ones involved in the theft of PGMs.

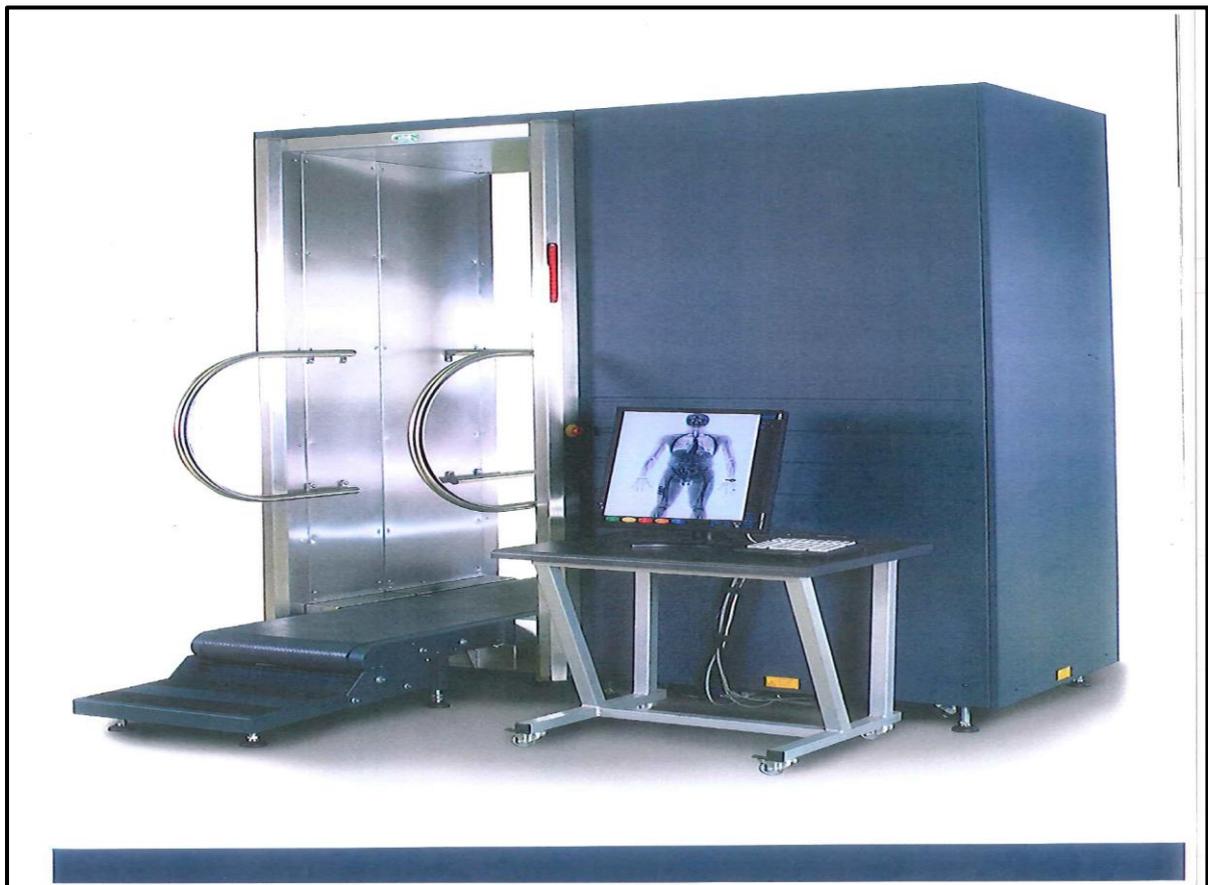
A low-dose X-ray body scanner is a technology which helps to eliminate the usual problems associated with conventional body-searching methods, and it sends a zero-tolerance message to potential syndicates. It is an essential security measure

to prevent smuggling of precious metals and offers outstanding image quality of the entire body, and with high image resolution. This makes it an effective security measure for the detection of things like precious metals, explosives, and weapons.

It is very important for Impala Platinum to consider installing such technologies – in order to eliminate the usual problems encountered with conventional body searching methods. It will help with the prevention of theft of PGMs, since it is more effective in detecting PGMs concealed inside the bodies of individuals.

The image below is of the Low-Dose X-ray body scanner machine, which is recommended to be installed – in order to assist with the prevention of theft of PGMs at Impala Platinum and possibly in other mining industries.

**Image of a recommended low-dose x-ray body scanner**



### 5.2.3 Recommendations to employees

During research study, it was found that employees are working with contractors and security officers to remove PGMs from the refinery. It was also established that employees are the one providing PGMs to contractors and security officers to remove PGMs from the place of origin since they have access to the PGMs and they work with the product on daily basis. It is recommended that employees:

- i. *Be vigilant at all times.* It is always easy for the crime-syndicate members to create an impression that they will succeed in the theft of PGMs, if employees appear not to be vigilant.
- ii. *Be assertive.* Be free to express your feelings, thoughts, and desires. Do not allow fellow employees recruit you to be involved in the theft of PGMs.
- iii. *Report any irregularities observed.* Always report suspicious activities, behaviour, or objects – to either your manager or Protection Services.
- iv. *Be the eyes and ears (for security).* Take the responsibility to report any information at your disposal, with regard to the theft of PGMs.
- v. *Familiarise themselves with company policies and procedures.* This will assist in terms of knowing their contents, the repercussions involved, and will help the employee to know the ‘do’s’ and ‘don’ts’, so that they do not contravene such policies.
- vi. *Always be free from company assets (PGMs).* Employees should be free from PGMs when going off duty – in order to eliminate the chances of apprehension by Protection Services.
- vii. *Be resilient.* Do not be tempted by other employees, by being offered illegitimate money to encourage co-operation with crime syndicates.

#### **5.2.4 Recommendations to the government**

Based on the findings regarding the theft of PGMs in the refinery and the involvement of crime syndicates categories as well as the exportation of the PGMs to the international underworld, it is recommended that the government:

- i. Implement and enforce stricter measures in terms of POCA that will force the unauthorised underworld market to pay heavy fines or be incarcerated for long sentences if found guilty of dealing/smuggling in PGMs illegally.
- ii. Ensures that licensed dealers of PGMs are visited on a regular basis by the Department of Mineral Resources Regulator and the SAPS, to ensure that any transactions and dealings are legitimate in accordance with the Precious Metals Act.
- iii. Ensures that a dedicated SAPS unit be established which will focus mainly on investigation of PGMs and precious stones. The members to be trained on how to effectively investigate the cases of PGMs and precious stones as well as to positively identify all types of PGMs produced by different mining industries.
- iv. Improve the criminal justice system, prosecute better and faster and more effectively, so that the message can be sent to criminal syndicates as a deterrent – that crime does not pay and that it has repercussions. The work relation also to improve for the betterment of convictions.
- v. Ensure that crime syndicate assets obtained during organised crime manner are seized and forfeited to the state. The Asset Forfeiture Unit members should be effectively trained on how to conduct an in-depth investigation and apply financial techniques and strategies to expand the scope of a criminal investigation through identifying and tracking assets for seizure and forfeiture.
- vi. The SAPS Organised Crime Unit, in conjunction with Interpol, to work hand-in-hand and better co-ordinate joint investigations into the theft of PGMs exported to international underworld syndicates.

- vii. The SAPS Organised Crime Unit to utilise unconventional techniques such as surveillance clandestine operations (undercover projects), infiltration of syndicates at all levels (agents and informers), penetration (recruitment of suspect as informers) to address crime syndicates in the theft of PGMs.

### **5.3 RECOMMENDATIONS FOR FURTHER RESEARCH**

It is recommended that further research be undertaken that will include other platinum-producing industries such as the Lonmin mine and the Anglo Platinum mine – as these are the three best platinum-producing industries in the world. It is also recommended that government agencies such as the South African Police Services (SAPS), Special Investigation Unit (SIU), South African Revenue Services (SARS) and National Prosecuting Authority (NPA) be included in the research study. The study undertaken proposes a new security RISK MANAGEMENT approach towards improving security risk-control measures in the mining industry – that will enable the prevention of theft of PGMs.

The case study focused on Impala Platinum Refinery and mines, and from it, the hierarchy levels of organised crime syndicates in South Africa and abroad were identified. It was also established that the Level One operatives are employees within the organisation and that they operate from their workplace. The *modus operandi* of Level One will be the same from one mining industry to the other. Further research should be considered on the security RISK MANAGEMENT approach to the prevention of theft of PGMs in the platinum industry in South Africa.

### **5.4 CONCLUSION**

This research has outlined the extent and impact of theft of PGMs at Impala Platinum mines and refinery in Springs, Gauteng, South Africa. The research study focused on the security risk management approach to the prevention of theft of PGMs at Impala Platinum mines and refinery. Emanating from the findings there is a need for improvement on the approach to the prevention strategy.

The findings demonstrated that individuals and syndicates are involved in the theft and that they comprise employees, contractors (KMA Workforce and LADS Constructions) and security officers. They work together to remove PGMs from the

place of origin at the refinery, through security measures which are in place, and are taken out of the plant without being detected.

The study illustrates the state of security measures in place and the desire to upgrade the existing security measures at Impala Platinum. The recommendations of the researcher will serve to deter theft as it is occurring now. In accordance with the respondents, theft of PGMs is a challenge to the company and in order for the organisation to overcome those challenges, recommendations made by the researcher should not be overlooked – but considered in the interests of the organisation.

The theft of PGMs is not only encountered by Impala Platinum; it also occurs in other platinum-producing mines and refineries in South Africa. Therefore it is vital that Impala Platinum and other mining industries meet to discuss the recommendations made in order to consider implementing them – in order to improve existing security measures.

The findings indicated that the *modus operandi* utilised by the crime syndicates (level one) in the refinery is similar in that the stolen product would be placed in a sample plastic bag and masking tape would be used to make up a rectum parcel and/or the PGMs would be placed in a surgical gloves and removed from the refinery. It is also evident from the findings that security measures in place are ineffective in the prevention of theft of PGMs. The crime syndicates (level one operatives) in the refinery are highly connected (selling PGMs) to crime syndicates (level two – illegal smelt houses) outside the refinery – who in turn sell the stolen material to Level Three - five, which is then exported to the underworld market.

Conceivably, the security RISK MANAGEMENT model as proposed in dealing with crime risk in the refinery, the research findings and recommendations made will help all management, security managers and security consultants to mitigate crime risk and overcome challenges facing the refinery and the industry as a whole.

## LIST OF REFERENCES

- Abadinsky, H. 2013. *Organised Crime*. (10<sup>th</sup> edition). Belmont, CA: Wadsworth.
- Anon. 2013a. Hundreds of millions being lost to platinum theft. *Mining Weekly*. 23 November. Available at: <http://www.miningweekly.com/article/hundredsofmillions-being-lost-to-platinum-theft-2001-11-23> (accessed on: 29/01/2013).
- Anon. 2013b. *Theft of platinum group metals*. Available at: <http://www.implats.theftofplatinumgroupmetals> (accessed on: 28/01/2013).
- Anon. 2014. *Participating in research: What is research*. Available at: <http://www.alzheimereurope.org/Research/Understanding-dementia-research/Particip> (accessed on: 25/04/2014).
- Anon. 2015a. *Legal definition of extortion*. Available at: <http://legal-dictionary.thefreedictionary.com/Extortion> (accessed on: 04/06/2015).
- Anon. 2015b. *Legal definition of racketeering*. Available at: <http://legal-dictionary.thefreedictionary.com/Racketeering> (accessed on: 04/06/2015).
- Anon. 2015c. *Low dose x-ray body scanning*. Available at: [http://www.xscann.com/xscann\\_home.htm](http://www.xscann.com/xscann_home.htm) (accessed on: 04/06/2015).
- Anon, 2015d. *The South African mining sector's contribution to GDP*. Available at: <http://www.chamberofmines.org.za/news/article/1> (accessed on: 09/06/2015).
- Anon. [Sa]. *Project yield investigations*. UNODC No.: ZAFx003. Case Law database. Vienna: United Nations Office on Drugs and Crime. Available at: [https://www.unodc.org/cld/case-law-doc/corruptioncrimetype/zaf/project\\_yield.html](https://www.unodc.org/cld/case-law-doc/corruptioncrimetype/zaf/project_yield.html) (accessed on: 04/03/2015).
- Babbie, E.R. 1992. *The practice of social research*. (6<sup>th</sup> edition). Belmont, CA: Wadsworth.
- Babbie, E.R. 2001. *Basics of social research*. (9<sup>th</sup> edition). Belmont, CA: Wadsworth.
- Babbie, E.R. 2010. *The practice of social research*. (12<sup>th</sup> edition). Belmont, CA: Wadsworth.
- Babbie, E.R. & Mouton, J. 2007. *The practice of social research*. (11<sup>th</sup> edition). Cape Town: Oxford University Press.
- Bailey, K.D. 1987. *Methods of social research*. (3<sup>rd</sup> edition). London: MacMillan.
- Berg, B.L. 2004. *Qualitative research methods for the social sciences*. Boston, MA: Pearson Education/ Allyn & Bacon.

- Bhamjee, F. 2012. Lonmin staff targeted in platinum theft ruckus. *Mail & Guardian*. 30 September.
- Black, J.A. & Champion, D.J. 1976. *Methods and issues in social research*. New York: Wiley.
- Bless, C. & Higson-Smith, C. 1995. *Fundamentals of social research methods: An African perspective*. (2<sup>nd</sup> edition). Lansdowne: Juta.
- Blyth, A. & Kovacich, G.L. 2006. *Information assurance: security in the information environment*. (2<sup>nd</sup> edition). London: Springer-Verlag.
- Bogdan, R.C & Biklen, S.K. 2003. *Qualitative research for education: An introduction to theory and methods*. (4<sup>th</sup> edition). Boston, MA: Allyn & Bacon.
- Broder, J.F. 2006. *Risk analysis and the security survey*. (3<sup>rd</sup> edition). Oxford: Butterworth/Heinemann.
- Coetzee, B. & Horn, R. 2007. *Product theft: Platinum Group Metals*. ISS Monograph Series No. 133. Pretoria: Institute for Security Studies.
- Cohen, L. 1989. *Research methods in education*. London: Routledge.
- Cohen, L & Manion, L. 2000. *Research methods in education*. (5<sup>th</sup> edition). London: Routledge.
- Collis, J. & Hussey, R. 2009. *Business research: a practical guide for undergraduate and postgraduate students*. (3<sup>rd</sup> edition). London: Palgrave/MacMillan.
- Conklin, J.E. 2010. *Criminology*. (9<sup>th</sup> edition). Boston: Pearson Education.
- Creswell, J.W. 2014. *Research design: Qualitative, quantitative and mixed methods approaches*. (4<sup>th</sup> edition). Thousand Oaks, CA: Sage.
- Denscombe, M. 2002. *Ground rules for good research: A 10 point guide for social researchers*. Philadelphia: Open University Press.
- De Vos, A.S., Strydom, H., Fouché, C.B. & Delport, C.S.L. 2011. *Research at grass roots: For the social sciences and human service professions*. (4<sup>th</sup> edition). Pretoria: Van Schaik.
- Du Plessis W.J. 1989. Modus operandi in misdadiger identifikasie. [Modus operandi in offender identification]. *Acta Criminologica: Southern African Journal of Criminology*, 2(1): 84-87.
- Du Preez, G.T. 1996. *Forensic criminalistics: Criminal Investigation*. (2<sup>nd</sup> edition). Pretoria: University of South Africa.
- Fouche, C.B. & De Vos, A.S. 2011. Selection of a researchable topic. (Pp. 89-91). In A.S. de Vos, H. Strydom, C.B. Fouche & C.S.L. Delport. (Eds). *Research at*

- grassroots: For the social sciences and human service professions*. (4<sup>th</sup> edition). Cape Town: Van Schaik.
- Gastrow, P. 2001. *Theft from South African mines and refineries: The illicit market for Gold and Platinum*. ISS Monograph Series No. 54. Cape Town: Institute for Security Studies.
- Geldenhuys, K. 2013. Platinum theft. *Servamus*, 106(12), December: 18-20.
- Gillham, B. 2008. *Developing a questionnaire*. (2<sup>nd</sup> edition). London: Continuum.
- Henning, E. Van Rensburg, W & Smith, B. 2011. *Finding your way in qualitative research*. Pretoria: Van Schaik.
- Horgan, J.J. 1979. *Criminal Investigation*. (2<sup>nd</sup> edition). New York: McGraw-Hill.
- Huysamen, G.K. 1994. *Methodology for the social and behavioural sciences*. Halfway House, Midrand: Southern Books.
- Kole, O.J. 2010. *An examination of security measures for the protection of petrol stations: An analysis of case studies in Gauteng*. Unpublished dissertation. MTech in Security Management. Pretoria: University of South Africa.
- Kraska, P.B. & Neuman, W.L. 2012. *Criminal justice and criminology research methods*. Upper Saddle River, NJ: Pearson.
- Kumar, R. 2011. *Research Methodology: A step by step guide for beginners*. (3<sup>rd</sup> edition). Thousand Oaks, CA: Sage.
- Leedy, P.D. & Ormrod, J.E. 2010. (9<sup>th</sup> edition). *Practical research: Planning and design*. Upper Saddle River, NJ: Pearson Education.
- Mabuza, K. 2011. Miner bust in police sting. *Sowetan*. 15 February.
- Mabuza, K. 2012. Police nab 5 in mining syndicate. *Sowetan*. 30 April.
- Mariampolski, H. 2001. *Qualitative market research*. Thousand Oaks, CA: SAGE.
- Mason, J. 2002. *Qualitative Research*. (2<sup>nd</sup> edition). Thousand Oaks, CA: Sage.
- Mathews, B. & Ross, L. 2010. *Research methods. A practical guide for the social sciences*. Harlow, Essex: Pearson.
- Maxfield, M.G. & Babbie, E. 2005. *Research methods for criminal justice and criminology*. Belmont: Wadsworth.
- Moody, D. 2002. *Empirical research methods*. Research Class. March 8, 15 & 22. Visiting Associate Professor, NTNU & Senior Research Fellow, Monash University (Melbourne, Australia).
- Mouton, J. 1996. *Understanding social research*. Pretoria: Van Schaik Publishers.

- Mouton, J. 2001. *How to succeed in your masters and doctoral studies: A South African guide and resource book*. Pretoria: Van Schaik.
- Mouton, J. & Marais, H.C. 1992. *Basic concepts in the methodology of the social sciences*. Pretoria: Human Science Research Council.
- Mouton, J. & Marais, H.C. 1996. *Research methodology: Basic concepts in the methodology of the social sciences*. Pretoria: Human Sciences Research Council.
- Nkosi, S. & Matsha, N. 2011a. The heavies Lonmin hired. *Mail & Guardian*. 23 September.
- Nkosi, S. & Matsha, N. 2011b. Police arrested for Lonmin staff attacks. *Mail & Guardian*. 25 November.
- Odendaal, N. 2001. Hundreds-of-millions being lost to platinum theft. *Mining weekly*. 23 November.
- Olckers, C. 2007. *An examination of the impact of residential security measures on the incidents of residential burglary in two selected northern suburbs of Johannesburg: A security risk management approach*. Unpublished dissertation. MTech in Security Risk Management. Pretoria: University of South Africa.
- Potgieter, D. 2011. Theft syndicates are mining scourge. *The New Age*. 28 September.
- Potgieter, D. 2012a. Family platinum ring bust. *The New Age*. 9 April.
- Potgieter, D. 2012b. New syndicate arrest. *The New Age*. 30 March.
- Rescoe, J.T. 1975. *Fundamental research statistics for the behavioural sciences*. New York: Holt, Rinehart & Wiston.
- Rogers, F.C. 2005. *Security practice III/Security Risk Management IV: SEP361/SRM4015*. (2<sup>nd</sup> edition). Florida: Technikon SA.
- Rogers, F.C. 2008. The security risk management approach to the measurement of crime in a private security context. *Acta Criminologica: Southern African Journal of Criminology*. CRIMSA conference special edition (3): 150-166.
- Rogers, F.C & Schoeman, J. 2009. *Security practice III (SEP3701). Module 1: Study units 1-5*. (Revised). Pretoria: University of South Africa.
- Rubin, H.J. & Rubin, I.S. 1995. *Qualitative interviewing: The art of hearing data*. Thousand Oaks CA: Sage.

- Schoonraad, N. 2003. *Managing financial communication towards a conceptual model*. Unpublished dissertation. MCom Communication Management. Pretoria: University of Pretoria. Available at: <http://repository.up.ac.za/dspace/bitstream/handle/2263/22943/Complete.pdf> (accessed on: 06/05/2014).
- Snyman, C.R. 1986. *Criminal law*. (2<sup>nd</sup> Edition). Durban: Butterworths.
- Swain, T. 2009. *Organised crime*. New York: Jax Desmond.
- The Oxford Dictionary*. (6<sup>th</sup> edition). 2000. s.v. "Syndicate". Oxford: Oxford University Press.
- Technikon SA. 2006. *Police field guide*. Florida: Technikon SA
- Tshivhidza, E. 2001. South Africa: Police bust 40 suspects for Platinum theft. *Bua News*. 6 November.
- Valsamakis, A.C. Vivian, R.W. & Du Toit, G.S. 2005. *Risk management*. (3<sup>rd</sup> edition). Durban: Heinemann.
- Van der Westhuizen, J. 1996. *Forensic criminalistics*. Johannesburg: Heinemann.
- Van Heerden, T.J. 1985. *Criminalistics*. Pretoria: University of South Africa.
- Venter, Z. 2006. *R200-million platinum scam exposed*. Available at: ?? <http://www.iol.co.za/news/south-africa/r200-million-platinum-scam-exposed-1.273993> (accessed on: 09/05/2013).
- Welman, J.C. & Kruger, S.J. (Eds). 1999. *Research methodology for business and administrative science*. South Africa: Technikon SA.
- Welman, J.C. & Kruger, S.J. 2001. *Research methodology*. (2<sup>nd</sup> edition). Cape Town: Oxford University Press.
- Welman, J.C. Kruger, S.J. & Mitchell, B. 2005. *Research methodology*. (3<sup>rd</sup> edition). Cape Town: Oxford University Press Southern Africa.
- Welman, J.C. Kruger, S.J. & Mitchell, B. 2012. *Research methodology*. (4<sup>th</sup> edition). Cape Town: Oxford.
- Wisker, C. 2001. *The postgraduate research handbook*. New York: Palgrave.
- Yin, R.K. 1984. *Case study research: Design and methods*. Newbury Park, CA: Sage.
- Yin, R.K. 2003. *Case study research: design and methods*. (3<sup>rd</sup> edition). Thousand Oaks, CA: SAGE.

## **LEGISLATION**

Department of Minerals and Energy, South Africa. 2005. Precious Metals Act No. 37 of 2005. *Government Gazette*, 570 (30061). Pretoria: Government Printers. 9 July.

South Africa. 1996. *The Constitution of the Republic of South Africa, Act 108 of 1996*. Pretoria: Government Printer.

South Africa. 1998. *Prevention of Organised Crime, Act 121 of 1998*. Pretoria: Government Printer.

South Africa. 2005. *Precious Metals Act 37 of 2005*. Pretoria: Government Printer.

South Africa. 1995. *Labour Relations Act 66 of 1995*. Pretoria: Government Printer.

The Presidency, South Africa. 2002. Private Security Industry Regulation Act No. 56 of 2001. *Government Gazette*, 77(23051). Pretoria: Government Printers. 25 January.

## **LIST OF CASE LAW**

*Sidumo and Another v Rustenburg Platinum Mines Ltd. and Others* (CCT 85/06) (2007) ZACC 22.

*National Director of Public Prosecutions v Naidoo and Others* (25395/04) (2006) ZAGPHC 30.

*Maphisa v Impala Platinum Refinery and others* (JA123/2013) (2015) ZALAC 10.

## **INTERVIEWS**

Interview No 1. 2013. Process Controller, Impala Platinum. Springs. 17 May.

Interview No 2. 2013. Process Controller, Impala Platinum. Springs. 17 May.

Interview No 3. 2013. Process Controller, Impala Platinum. Springs. 17 May.

Interview No 4. 2013. Process Controller, Impala Platinum. Springs. 17 May.

Interview No 5. 2013. Process Controller, Impala Platinum. Springs. 17 May.

Interview No 6. 2013. Senior Process Controller, Impala Platinum. Springs. 24 May.

Interview No 7. 2013. Senior Process Controller, Impala Platinum. Springs. 24 May.

Interview No 8. 2013. Senior Process Controller, Impala Platinum. Springs. 24 May.

Interview No 9. 2013. Senior Process Controller, Impala Platinum. Springs. 24 May.

Interview No 10. 2013. Senior Process Controller, Impala Platinum. Springs. 24 May.

Interview No 11. 2013. Process Controllers, Impala Platinum. Springs. 14 June.

Interview No 12. 2013. Process Controller, Impala Platinum. Springs. 14 June.

Interview No 13. 2013. Process Controller, Impala Platinum. Springs. 14 June.

Interview No 14. 2013. Process Controller, Impala Platinum. Springs. 14 June.

Interview No 15. 2013. Process Controller, Impala Platinum. Springs. 14 June.

Interview No 16. 2013. Senior Process Controller, Impala Platinum. Springs. 28 June.

Interview No 17. 2013. Senior Process Controller, Impala Platinum. Springs. 28 June.

Interview No 18. 2013. Senior Process Controller, Impala Platinum. Springs. 28 June.

Interview No 19. 2013. Senior Process Controller, Impala Platinum. Springs. 28 June.

Interview No 20. 2013. Senior Process Controller, Impala Platinum. Springs. 28 June.

Interview No 21. 2013. Process Controller, Impala Platinum. Springs. 12 July.

Interview No 22. 2013. Process Controller, Impala Platinum. Springs. 12 July.

Interview No 23. 2013. Process Controller, Impala Platinum. Springs. 12 July.

Interview No 24. 2013. Process Controller, Impala Platinum. Springs. 12 July.

Interview No 25. 2013. Process Controller, Impala Platinum. Springs. 12 July.

Interview No 26. 2013. Senior Process Controller, Impala Platinum. Springs. 16 August.

Interview No 27. 2013. Senior Process Controller, Impala Platinum. Springs. 16 August.

Interview No 28. 2013. Senior Process Controller, Impala Platinum. Springs. 16 August.

Interview No 29. 2013. Senior Process Controller, Impala Platinum. Springs. 16 August.

Interview No 30. 2013. Senior Process Controller, Impala Platinum. Springs. 16 August.

Interview No 31. 2013. Contractor, KMA Workforce, Impala Platinum. Springs. 6 September.

Interview No 32. 2013. Contractor, KMA Workforce, Impala Platinum. Springs. 6 September.

Interview No 33. 2013. Contractor KMA Workforce, Impala Platinum. Springs. 6 September.

Interview No 34. 2013. Contractor KMA Workforce, Impala Platinum. Springs. 6 September.

Interview No 35. 2013. Contractor KMA Workforce, Impala Platinum. Springs. 20 September.

Interview No 36. 2013. Contractor Lads Construction, Impala Platinum. Springs. 20 September.

Interview No 37. 2013. Contractor Lads Construction, Impala Platinum. Springs. 20 September.

**ANNEXURE A: UNISA Ethics approval letter**



**10 November 2014**

**COLLEGE OF LAW ETHICS SUB-COMMITTEE**

Dear Mr SJ Mokhuane

**REQUEST FOR ETHICAL CLEARANCE MTECH SECURITY MANAGEMENT: A SECURITY RISK MANAGEMENT APPROACH TO THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA PLATINUM MINES AND REFINERY**

The Unisa College of Law Research Ethics Sub-committee is pleased to inform you that ethical clearance for the above research project has been approved.

We hope and trust that as you proceed with your empirical study you will continue to adhere to the values and principles expressed in the UNISA Research Ethics Policy, which can be found at the following web address on the UNISA website:

[http://www.unisa.ac.za/cmsys/staff/contents/departments/res\\_policies/docs/Policy\\_Research%20Ethics\\_rev%20app%20Council\\_22.06.2012.pdf](http://www.unisa.ac.za/cmsys/staff/contents/departments/res_policies/docs/Policy_Research%20Ethics_rev%20app%20Council_22.06.2012.pdf)

Yours faithfully

A handwritten signature in black ink, appearing to read "M Schoeman", is written over a light grey rectangular background.

**Prof M Schoeman**  
**Delegated Chairperson**  
**College of Law Ethics Review Committee**  
**Tel: +27 12 429 6680**  
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**ANNEXURE B: Questionnaire survey for security managers**

**QUESTIONNAIRE SURVEY: SECURITY MANAGERS**

**RESEARCH STUDY: A SECURITY RISK MANAGEMENT APPROACH FOR THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA MINES AND REFINERY**

**Instructions:**

Please answer all the questions. The information collected for this research study regarding prevention of theft of Platinum Group Metals (PGMs) will help the researcher to formulate effective and efficient security measures for the problems of theft encountered by Impala Platinum Mines and Refinery. You do not need to identify yourself and the researcher will ensure the response is treated with strict confidentiality and anonymity of participant is guaranteed. Please indicate with an 'X' in an appropriate box or write a response in the space provided.

**SURVEY QUESTIONS:**

**SECTION A (Demographic Information)**

The following questions are for statistical purposes only:

1. **Gender**

Male		Female	
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2. **Age**

18 – 30		30 – 50		More than 50	
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3. **Race**

Black		White		Coloured		Indian	
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4. **Marital Status**

Single		Married		Divorced		Widow / Widower	
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5. **How many dependants do you have?**

One		Two		Three		Four or more	
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6. **What is your highest educational qualification?**

Std 8 / Grade 10		Std 9 / Grade 11		Std 10 / Grade 12	
3 year Diploma / Degree				Postgraduate Degree	

**7. What is your current work position?**

Investigating Officer		Superintendent Investigations		Investigations Manager	
Security Manager					

**8. How many years of work experience do you have?**

1 year		2 years		3-5 years		5-10 years		More than 10 years	
--------	--	---------	--	-----------	--	------------	--	--------------------	--

**SECTION B (Crime Trends)**

**9. Are you part of the in-house security or working for a Security Service Provider?**

In-house	Yes	No
Service provider	Yes	No

**10. How many security employees are in service (on site) of the Security Company you are working for?**

---

**11. How long has this Company been a Service Provider to Impala Platinum Mines and Refinery?**

---

**12. Do you experience any problems regarding theft of Platinum Group Metals (PGMs) at the site you are working?**

Yes		No	
-----	--	----	--

**13. Do you have a dedicated team that deals with the theft of Platinum Group Metals (PGMs) at your site?**

Yes		No	
-----	--	----	--

**14. If yes, how many members are involved in dealing with theft?**

1-5 people		6-10 people		10 or more people	
------------	--	-------------	--	-------------------	--

15. What are the underlying reasons for the theft of PMGs?

---

16. Who do you think is involved in the theft?

A. Employees	Yes		No	
B. Contractors	Yes		No	
C. Security officers	Yes		No	
D. Other	Yes		No	

17. If other, who do you think is involved?

---

18. How often is theft of Platinum Group Metals (PGMs) committed on your site?

1 x per week		5 x per week		1 x per month		Other	
--------------	--	--------------	--	---------------	--	-------	--

19. What are the causes of theft of Platinum Group Metals (PGMs)?

---

20. Do you think theft of Platinum Group Metals (PGMs) is a challenge to the mining and refining industry?

Yes		No	
-----	--	----	--

21. If yes, why do you say so?

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22. What is the extent of the losses suffered by Impala Platinum since 2004 to 2014?

R1 000 000	
R2 000 000	
R3 000 000	
Over and above	

23. Do you meet with other Mining Industries to deliberate on challenges facing the industry?

Yes		No	
-----	--	----	--

24. If yes, how often do you meet?

---

25. What is your relationship with the SAPS Organised Crime Unit regarding theft of Platinum Group Metals (PGMs)?

Good		Bad		Indifferent	
------	--	-----	--	-------------	--

26. Do these thefts of Platinum Group Metals (PGMs) have any negative impact on the mining industry?

Yes		No		Do not know	
-----	--	----	--	-------------	--

27. How is your relationship with the National Prosecuting Authority (NPA) regarding theft of Platinum Group Metals (PGMs)?

Good		Bad		Indifferent	
------	--	-----	--	-------------	--

28. What is the success rate regarding convictions of theft of Platinum Group Metals (PGMs)?

Good		Bad		Indifferent	
------	--	-----	--	-------------	--

29. Do you think SAPS Organised Crime Unit members are involved in corruption / criminal activities of Platinum Group Metals at Impala Platinum Mines and Refinery?

Yes		No	
-----	--	----	--

30. If yes, why do you think so?

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31. Do you think the stolen product (PGMs) is exported internationally?

Yes		No	
-----	--	----	--

32. Where do you think they export the stolen product (PGMs) to?

---

33. Does your company have Security Awareness Programmes in place regarding the theft of Platinum Group Metals (PGMs)?

Yes		No	
-----	--	----	--

34. If yes, how often are the programmes promoted?

---

35. Do you screen Security applicants before employing them?

Yes		No	
-----	--	----	--

36. Do you assess Security members periodically to determine their involvement in the theft of Platinum Group Metals (PGMs)?

Yes		No	
-----	--	----	--

37. If yes, how often do you assess them?

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38. How are these assessments on Security members done?

---

**SECTION C (Security measures)**

39. What security measures are in place at Impala Platinum mines and refinery?

---

40. How would you rate the Security measures in place?

Ineffective	Yes	No
Effective	Yes	No
Most effective	Yes	No

41. To what extent do you agree with this statement?

Effective	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

42. Are CCTV surveillance cameras in operation 24/7?

Yes		No	
-----	--	----	--

43. Are the CCTV cameras monitored from a Control Room?

Yes		No	
-----	--	----	--

44. If yes, how many Security members do the monitoring?

---

45. Are the Security Systems regularly maintained?

Yes		No	
-----	--	----	--

46. How often are these Systems maintained?

Daily		Weekly		Monthly	
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47. Do you have Security Procedures and Policies in place?

Yes		No	
-----	--	----	--

48. If yes, do you and the employees familiarise yourselves with the contents thereof?

---

49. Do you have any Security Awareness Programmes regarding crime in general?

Yes		No	
-----	--	----	--

50. If yes, how are these Awareness Programmes promoted?

---

51. Is there anything else that you wish to say on this matter?

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**ANNEXURE C: Questionnaire survey for security investigators**

**QUESTIONNAIRE SURVEY: SECURITY INVESTIGATORS**

**RESEARCH STUDY: A SECURITY RISK MANAGEMENT APPROACH FOR THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA MINES AND REFINERY**

**Instructions:**

*Please answer all the questions. The information collected for this research study regarding prevention of theft of Platinum Group Metals (PGMs) will help the researcher to formulate effective and efficient security measures for the problems of theft encountered by Impala Platinum Mines and Refinery. You do not need to identify yourself and the researcher will ensure the response is treated with strict confidentiality and anonymity of participant is guaranteed. Please indicate with an 'X' in the appropriate box or write a response in the space provided.*

**SURVEY QUESTIONS:**

**SECTION A (Demographic Information)**

*The following questions are for statistical purposes only:*

1. **Gender**

Male		Female	
------	--	--------	--

2. **Age**

18 – 30		30 – 50		More than 50	
---------	--	---------	--	--------------	--

3. **Race**

Black		White		Coloured		Indian	
-------	--	-------	--	----------	--	--------	--

4. **Marital Status**

Single		Married		Divorced		Widow / Widower	
--------	--	---------	--	----------	--	-----------------	--

5. **How many dependants do you have?**

One		Two		Three		Four or more	
-----	--	-----	--	-------	--	--------------	--

6. **What is your highest educational qualification?**

Std 8 / Grade 10		Std 9 / Grade 11		Std 10 / Grade 12	
3 year Diploma / Degree				Postgraduate Degree	

**7. What is your current work position?**

Investigating Officer		Superintendent Investigations		Investigations Manager		Security Investigator	
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**8. How many years of work experience do you have?**

1 year		2 years		3-5 years		5-10 years		More than 10 years	
--------	--	---------	--	-----------	--	------------	--	--------------------	--

**SECTION B (Crime Trends)**

**9. Do you experience any problems of theft of Platinum Group Metals (PGMs) at Impala Platinum Mines and Refinery?**

Yes		No	
-----	--	----	--

**10. Who do you think is involved in the theft?**

A. Employees	Yes		No	
B. Contractors	Yes		No	
C. Security officers	Yes		No	
D. Other	Yes		No	

**11. If other, who do you think is involved?**

---

**12. Do you think employees play a role in the theft of PGMs?**

Yes		No	
-----	--	----	--

**13. If yes, what role do they play in the theft?**

---

**14. What are the causes of theft of Platinum Group Metals (PGMs)?**

---

**15. What are the underlying reasons for the theft of PGMs?**

---

**16. Do you usually get confessions from perpetrators during investigations?**

Yes		No	
-----	--	----	--

17. What is the extent of the losses suffered by Impala Platinum since 2004 to 2014?

R1 000 000		R2 000 000		R3 000 000		Over and above	
------------	--	------------	--	------------	--	----------------	--

18. How is your relationship with the SAPS Organised Crime Unit members regarding theft of Platinum Group Metals (PGMs)?

---

19. Do you think SAPS Organised Crime Unit members are involved in corruption / criminal activities of Platinum Group Metals at Impala Platinum Mines and Refinery?

Yes		No	
-----	--	----	--

20. If yes, why do you say so?

---

21. How is your relationship with the National Prosecution Authority (NPA) regarding theft of Platinum Group Metals (PGMs)?

---

22. What is the success rate regarding conviction of perpetrators for the theft of Platinum Group Metals (PGMs)?

---

23. Do you use an intelligence network to collect and gather information regarding theft of Platinum Group Metals (PGMs)?

Yes		No	
-----	--	----	--

24. What happens to individuals who are caught stealing?

---

25. What do you do with the exhibit when found on the suspect?

---

26. Do you think that the stolen material/product (PGMs) is exported internationally?

Yes		No	
-----	--	----	--

27. How is the material exported?

---

28. Do you think that the criminals work alone or in groups?

A. Alone	Yes		No	
B. Groups	Yes		No	

29. What are offenders' demographic characteristics, such as age and gender?

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30. Is there an ethnic component?

Yes		No	
-----	--	----	--

31. What is the modus operandi used in the theft of PGMs at Impala Platinum mines and refinery?

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32. Do you have any other information regarding theft of Platinum Group Metals (PGMs)?

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**SECTION C (Security measures)**

33. What security measures are in place at Impala Platinum mines and refinery?

---

34. How would you rate the Security measures in place?

Ineffective	Yes	No
Effective	Yes	No
Most effective	Yes	No

35. To what extent do you agree with this statement?

Effective	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree

36. Is CCTV surveillance cameras in operation 24/7?

Yes		No	
-----	--	----	--

37. Are the CCTV cameras monitored from a Control Room?

Yes		No	
-----	--	----	--

38. If yes, how many security officers do the monitoring?

---

39. Are the Security Systems regularly maintained?

Yes		No	
-----	--	----	--

40. How often are the systems maintained?

Daily		Weekly		Monthly	
-------	--	--------	--	---------	--

41. Do you have Security Policies and Procedures in place?

Yes		No	
-----	--	----	--

42. If yes, are you and the employees familiar with the contents thereof?

---

43. Do you have any Security Awareness programmes regarding crime in general?

Yes		No	
-----	--	----	--

44. If yes, how is this Awareness Programme promoted?

---

**ANNEXURE D: Questionnaire survey for security officers**

**QUESTIONNAIRE SURVEY: SECURITY OFFICERS**

**RESEARCH STUDY: A SECURITY RISK MANAGEMENT APPROACH FOR THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA MINES AND REFINERY**

**Instructions:**

Please answer all the questions. The information collected for this research study regarding prevention of theft of Platinum Group Metals (PGMs) will help the researcher to formulate effective and efficient security measures for the problems of theft encountered by Impala Platinum Mines and Refinery. You do not need to identify yourself and the researcher will ensure the response is treated with strict confidentiality and anonymity of participant is guaranteed. Please indicate with an 'X' in an appropriate box or write a response in the space provided.

**SURVEY QUESTIONS:**

**SECTION A (Demographic Information)**

The following questions are for statistical purposes only:

1. **Gender**

Male		Female	
------	--	--------	--

2. **Age**

18 – 30		30 – 50		More than 50	
---------	--	---------	--	--------------	--

3. **Race**

Black		White		Coloured		Indian	
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4. **Marital Status**

Single		Married		Divorced		Widow / Widower	
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5. **How many dependants do you have?**

One		Two		Three		Four or more	
-----	--	-----	--	-------	--	--------------	--

6. **What is your highest educational qualification?**

Std 8 / Grade 10		Std 9 / Grade 11		Std 10 / Grade 12	
3 year Diploma / Degree			Postgraduate Degree		

7. What is your current work position?

Security officer		Junior Security officer	
------------------	--	-------------------------	--

8. How many years of work experience do you have?

1 year		2 years		3-5 years		5-10 years		More than 10 years	
--------	--	---------	--	-----------	--	------------	--	--------------------	--

9. What courses have you attended?

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**SECTION B (Crime Trends)**

10. What are the causes of theft of Platinum Group Metals (PGMs)?

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11. Do you think that the stolen material (PGMs) is exported?

Yes		No	
-----	--	----	--

12. What are the underlying reasons for the theft of PGMs?

---

13. Do you think criminals work alone or in groups?

C. Alone	Yes		No	
D. Groups	Yes		No	

14. What are the offenders' demographic characteristics, such as age, gender, etc.?

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15. Is there an ethnic component?

Yes		No	
-----	--	----	--

16. What is the modus operandi used to commit theft of Platinum Group Metals (PGMs)?

---

17. Who do you think is involved in the theft of PGMs?

A. Employees	Yes		No	
B. Contractors	Yes		No	
C. Security officers	Yes		No	
D. Other	Yes		No	

18. If yes, why do you think so?

---

19. What is the role of employees in the theft of Platinum Group Metals (PGMs)?

---

20. What is your relationship with Security Investigators regarding theft of Platinum Group Metals (PGMs)?

Good		Bad		Indifferent	
------	--	-----	--	-------------	--

21. Do you have any important information regarding theft of Platinum Group Metals (PGMs)?

Yes		No	
-----	--	----	--

22. If yes, please provide such information.

---

## **ANNEXURE E: CONSENT FORM USED TO CONDUCT INTERVIEWS**

### **AGREEMENT:**

I hereby consent to:

- being interviewed on the topic “**A SECURITY RISK MANAGEMENT APPROACH FOR THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA PLATINUM MINES AND REFINERY**”;
- follow-up interviews if necessary;
- the interviews being recorded in writing or by using a tape recorder;
- the use of data derived from these interviews by the interviewer in a research report as he deems appropriate.

I also understand that:

- I am free to end my involvement or to cancel my consent to participate in the research at any time should I want to;
- Information rendered up to the point of my termination of participation could, however, still be used by the researcher;
- Anonymity is guaranteed by the researcher and data will under no circumstances be reported in such a way as to reveal my identity;
- I am free to determine that specific information that I reveal should not be recorded in writing;
- No reimbursement will be made by the researcher for information rendered or for my participation in this project;
- I will in no way derive any personal benefit from taking part in this research project;
- By signing this agreement I undertake to give honest answers to reasonable questions and not to mislead the researcher;
- I will receive the original copy of this agreement on signing it.

I hereby acknowledge that the researcher/interviewer:

- Discussed the aims and objectives of this research project with me;
- Informed me about the contents of this agreement;
- Explained the implications of my signing this agreement.

In co-signing this agreement the researcher undertakes to:

- Maintain confidentiality, anonymity, and privacy regarding the identity of the subject and information rendered by the interviewee.

\_\_\_\_\_  
**(Interviewee signature)**

\_\_\_\_\_  
**(Interviewer signature)**

\_\_\_\_\_  
**(Date)**

\_\_\_\_\_  
**(Date)**

I, (interviewer signature) \_\_\_\_\_ certify that I explained the contents of the above document

## **ANNEXURE F: INTERVIEW SCHEDULE OF QUESTIONS USED DURING INTERVIEWS**

1. This interviews purpose is to look into ways to prevent and detect theft by employees, contractors and security officers in this company. Do you understand?
2. By theft we mean stealing company assets. Do you think theft of Platinum Group Metals (PGMs) is a problem in this company?
3. What is your job title?
4. What does your daily job entails?
5. If employees, contractors or security officers are stealing from the company, why do you think they would do it?
6. If you knew that an employee, a contractor or security officer were stealing from the company, what would you do?
7. If an employee, contractor or security officer wanted to steal from the company, how would he or she do it and get away with it?
8. Would you as an employee, contractors or security officer report any criminal activities you observed in your company?
9. Do you think dishonest employees, contractors or security officer's work together to steal from the company?
10. In your opinion, why do they steal from the company?
11. Do you ever think of stealing from the company if the opportunity arises?

12. Are the Platinum Group Metals (PGMs) easily accessible to be stolen by the criminals?
13. In your opinion, do you think security measures in place are optimal and effective?
14. Do you think SAPS members are also involved in the theft of PGMS?
15. Have you ever witness another employee, contractor or security officer stealing from the company?
16. In your opinion, when is this theft of PGMS committed?
17. How do these criminals steal from the company?
18. Do you know the employees, contractors or security officers who are involved in the theft of PGMS?
19. What should the company do to prevent theft of PGMS?
20. Do you think the company should make use of the polygraph before employing people?
21. Do you have any other information regarding possible theft of PGMS in the company?

**ANNEXURE G: DOCKET ANALYSIS PRO FORMA SHEETS USED FOR DOCKET ANALYSIS**

**1. DOCKET ANALYSIS**

<u>IMPALA CASE NO.</u>	<u>SAPS CASE NO.</u>	<u>TIME</u>	<u>DAY</u>	<u>LOCATION</u>	<u>TYPE OF PRODUCT</u>	<u>VALUE OF PRODUCT</u>	<u>NO. OF SUSPECTS</u>	<u>EMPLOYEE / CONTRACTOR</u>	<u>MODUS OPERANDI</u>	<u>ADDITIONAL INFORMATION</u>

**2. INFORMATION RELATED TO ARRESTS, DISCIPLINARY HEARINGS AND CRIMINAL CONVICTIONS OF SUSPECTS**

<u>NAME</u>	<u>ID NO.</u>	<u>AGE</u>	<u>SEX</u>	<u>MARITAL STATUS</u>	<u>LANGUAGE</u>	<u>RESIDENTIAL ADDRESS</u>	<u>DISCIPLINARY RESULT</u>	<u>CRIMINAL COURT RESULT</u>	<u>COMPANY</u>	<u>ADDITIONAL SUSPECT INFORMATION</u>

**ANNEXURE H: PERMISSION REQUEST LETTER TO CONDUCT RESEARCH  
AT IMPALA PLATINUM MINES AND REFINERY**



<b>SECURITY MANAGEMENT PROGRAMME DEPT. OF CRIMINOLOGY &amp; SECURITY SCIENCE SCHOOL OF CRIMINAL JUSTICE, COLLEGE OF LAW Prof. A. de V. Minnaar Tel: (+27) (0)12-433 9530 Cell: 0838949485 Fax2email: 0865190625 e-mail: aminnaar@unisa.ac.za F1-22 Brooklyn House, Veale St</b>	<b>Muckleneuk Campus Preller St Muckleneuk Ridge, Pretoria PO Box 392 UNISA 0003 City of Tshwane Gauteng, South Africa</b>
---	--

Group Protection Services Manager,  
Impala Platinum  
P.O. Box 222  
Springs 1560

Dear Sir,

**REQUEST FOR PERMISSION TO UNDERTAKE A RESEARCH STUDY AT YOUR ORGANISATION**

***Mr Seadimo Joseph Mokhuane*** is currently a registered student busy with his research studies for a Master's Degree (MTech) at the University of South Africa (UNISA) Pretoria in the Department of Criminology & Security Science. *His research title is "A SECURITY RISK MANAGEMENT APPROACH TO THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA PLATINUM MINES AND REFINERY"*.

The primary purpose of the research study includes the following:

- To identify possible weaknesses in security measures at Impala Platinum Mines and Refinery;
- To investigate the root causes of theft of Platinum Group Metals (PGMs);
- To determine the modus operandi of perpetrators;
- To determine the involvement of employees and contractors (if any) in the theft of Platinum Group Metals (PGMs);
- To determine the involvement (if any) of security officers in the theft of Platinum Group Metals (PGMs);
- To determine the role played by organised crime syndicates outside Impala;
- Based on the research results, recommendations regarding a holistic approach in the implementation of effective and efficient security measures will be formulated and submitted to Impala Platinum mines and refinery to improve the security measures.

Since theft of Platinum Group Metals (PGMs) is a challenge encountered by the mining industry of South Africa, three questionnaires have been developed, one for detectives, one for security investigators and one for security managers.



Accordingly we would like to request permission for Mr Mokhuane to undertake and administer the questionnaires or examine case dockets with a sample of, or selected members of your company/organisation/department. The completed questionnaires will be collected by the researcher personally.

Once permission is granted, the researcher would then be in contact with you or a representative of your company/organisation/department for the scheduling of any examining of case dockets or administering of the research questionnaires for the survey with the relevant employees in the company/organisation/department.

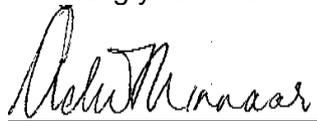
The researcher will personally administer the questionnaires. The researcher will take into account all relevant ethical considerations, especially in relation to the freedom from physical or psychological harm; disclosure about the nature of the research; and privacy.

The research information will play an imperative role in the decisions taken and affecting mining industry. Your company's participation in the research study would therefore immeasurably add to the above research, since the wider the participation, the more enriched the collected data would be.

Please note that respondents are not required to identify themselves in the questionnaires. The researcher will ensure that all responses are treated with strict confidentiality and the anonymity of the participants is guaranteed.

Attached, for your information, is the approved research proposal, and the questionnaires for the survey to be administered to a sample of, or persons from Impala Platinum, inter alia from your company/organisation/department.

Thanking you in advance,

 (Prof.)

**Ade V Minnaar**  
**Programme Head: Security Management**  
**Department of Criminology & Security Science**  
**School of Criminal Justice, College of Law**  
**UNISA**

 Mr

**Joseph Mokhuane**  
**MTech Student, Programme: Security Management**  
**Department of Criminology & Security Science**  
**School of Criminal Justice, College of Law UNISA**  
**Student Number: 3773-03-04**  
**Tel: (011)3603358, Cell: 0828832568**

**Date:** \_\_\_\_\_

**ANNEXURE I: APPROVAL LETTER TO CONDUCT RESEARCH AT IMPALA PLATINUM MINES AND REFINERY**



JS Stevenson  
Group Production Manager: Refining

Tel: +27 11 360  
Fax: +27 11 360  
e-mail: scott.stevenson@implats.co.za

Prof. A. de V. Minnaar  
Security Management Programme  
Dept. of Criminology & Security Science  
School of Criminal Justice  
College of Law

**PERMISSION TO UNDERTAKE A RESEARCH STUDY AT IMPALA PLATINUM REFINERIES**

This organisation received a research proposal from Mr Seadimo Joseph Mokhuane titled: "A SECURITY RISK MANAGEMENT APPROACH TO THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGM's): CASE STUDY OF IMPALA PLATINUM MINES AND REFINERY".

The research proposal together with developed questionnaires, which had to be administered, was perused.

Permission to undertake a research study and to administer questionnaires is hereby granted.

Regards,

 5/9/2013

**JS STEVENSON**

**GROUP PRODUCTION MANAGER: REFINING**

**Impala Platinum Limited**

Reg. No. 1952/071942/06

2 Fricker Road • Illovo • 2196 • Private Bag X18 • Northlands • 2116 • South Africa  
Tel: +27 11 731 9000 • Fax: +27 11 731 9254 • www.implats.co.za

**Directors** : GS Potgieter (Chairman)  
JC Andrews • B Berlin • PA Dunne\*† • PD Finney\* • CS Mogotsi  
OM Poole • CA Smith • S Vivier

**Secretary** : A Parboosing  
\*British

†MHSA 2A.(1)

Ref: Joseph\MTech\Implats - Permission Letter

## **ANNEXURE J: COVER LETTER FOR SECURITY MANAGERS**

### **Covering Letter for Security Managers' questionnaire survey**

Dear Respondent,

#### **A Security Risk Management approach to the prevention of theft of Platinum Group Metals (PGMs): Case study of Impala Platinum Mines and the Refinery.**

I am currently a student busy with my research studies for a Master's Degree at the University of South Africa (UNISA) titled "A SECURITY RISK MANAGEMENT APPROACH TO THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA PLATINUM MINES AND REFINERY". These studies are part of a series of research projects being implemented by the Department of Security Management at UNISA.

Please find attached a questionnaire on Prevention of Theft of Platinum Group Metals (PGMs) which deals with issues regarding the main causes of theft and the impact in the mining industry and government.

If any verification is required please contact the Programme Head Security Management, Prof. Anthony Minnaar (Department of Criminology & Security Science, School of Criminal Justice, College of Law at UNISA, Tel: (012)4292160 or Cell: 0838949485, e-mail: aminnaar@unisa.ac.za).

The primary purpose of this research study is as follows:

- To identify weaknesses in security measures;
- To investigate the root causes of theft of Platinum Group Metals (PGMs);
- To look at the modus operandi of perpetrators;
- To determine the involvement of security officers in the theft of Platinum Group Metals (PGMs);
- To determine the roles of employees and security officers towards security measures;
- To determine, Organised Crime syndicates operating outside mining industry;

You are kindly requested to complete the questions in the attached questionnaire and return the completed questionnaire in the self-addressed envelope supplied. You are not required to provide your name or any other identification. All information will be treated with confidentiality and respondents will remain anonymous. When the final report is completed, it will be made available to all interested persons.



(Mr)

SJ MOKHUANE

Tel: (011)3603358, Fax: (011)3603359 or Cell: 0828832568

## **ANNEXURE K: COVER LETTER FOR SECURITY INVESTIGATORS**

### **Covering letter for security investigators' questionnaire survey**

Dear Respondent,

#### **A Security Risk Management approach to the prevention of theft of Platinum Group Metals (PGMs): Case study of Impala Platinum Mines and the Refinery.**

I am currently a post graduate student busy with my research studies for a Master's Degree at the University of South Africa (UNISA) titled "A SECURITY RISK MANAGEMENT APPROACH TO THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA PLATINUM MINES AND REFINERY". These studies are part of a series of research projects being implemented by the Department of Security Management at UNISA.

Please find attached a questionnaire on Prevention of Theft of Platinum Group Metals (PGMs) which deals with issues regarding the main causes of theft and the impact in the mining industry and government.

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The primary purpose of this research study is as follows:

- To identify weaknesses in security measures;
- To investigate the root causes of theft of Platinum Group Metals (PGMs);
- To look at the modus operandi of perpetrators;
- To determine the involvement of employees and contractors in the theft of Platinum Group Metals (PGMs);
- To determine the involvement of security officers in the theft of Platinum Group Metals (PGMs);
- To determine the roles of employees and security officers towards security measures;
- To determine organised crime syndicates operating outside mining industry;

You are kindly requested to complete the questions in the attached questionnaire and return the completed questionnaire in the self-addressed envelope supplied. You are not required to provide your name or any other identification. All information will be treated with confidentiality and respondents will remain anonymous. When the final report is completed, it will be made available to all interested persons.



(Mr)

SJ MOKHUANE

Tel: (011)3603358, Fax: (011)3603359 or Cell: 0828832568

## **ANNEXURE L: COVER LETTER FOR SECURITY OFFICERS**

### **Covering letter for security officers' questionnaire survey**

Dear Respondent,

#### **A security risk management approach to the prevention of theft of Platinum Group Metals (PGMs): Case study of Impala Platinum mines and the refinery.**

I am currently a post graduate student busy with my research studies for a Master's Degree at the University of South Africa (UNISA) titled "A SECURITY RISK MANAGEMENT APPROACH TO THE PREVENTION OF THEFT OF PLATINUM GROUP METALS (PGMs): CASE STUDY OF IMPALA PLATINUM MINES AND REFINERY". These studies are part of a series of research projects being implemented by the Department of Security Management at UNISA.

Please find attached a questionnaire on Prevention of Theft of Platinum Group Metals (PGMs) which deals with issues regarding the main causes of theft and the impact in the mining industry and government.

If any verification is required please contact the Programme Head, Security Management, Prof. Anthony Minnaar (Department of Criminology & Security Science, School of Criminal Justice, College of Law at UNISA, Tel: (012)4292160 or Cell: 0838949485, e-mail: aminnaar@unisa.ac.za).

The primary purpose of this research study is as follows:

- To identify weaknesses in security measures;
- To investigate the root causes of theft of Platinum Group Metals (PGMs);
- To look at the modus operandi of perpetrators;
- To determine the involvement of employees and contractors in the theft of Platinum Group Metals (PGMs);
- To determine the involvement of security officers in the theft of Platinum Group Metals (PGMs);
- To determine the roles of employees and security officers towards security measures;
- To determine organised crime syndicates operating outside mining industry;

You are kindly requested to complete the questions in the attached questionnaire and return the completed questionnaire in the self-addressed envelope supplied. You are not required to provide your name or any other identification. All information will be treated with confidentiality and respondents will remain anonymous. When the final report is completed, it will be made available to all interested persons.



(Mr)

SJ MOKHUANE

Tel: (011)3603358, Fax: (011)3603359 or Cell: 0828832568

**ANNEXURE M: LANGUAGE EDITING CERTIFICATE**

# **COPY-WRITING**

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Specialist Consultants

**Date:** 31/07/2016

**Client:** Joseph Mokhuane

I, **Dr David Barraclough** - an academic editor of more than 25 years standing - did a language edit of a thesis by Joseph Mokhuane, in July 2015.

The thesis included five separate chapters. Editing was done with Word track changes turned on and 29 comments and queries were made there to improve the text further.

My amendments related mainly to grammatical and other linguistic aspects, in order to improve the clarity and readability of the document. Significant and varied changes were made.

Please note that we operate under a strict code of academic ethics and **do not rewrite** academic content. Such text should be in the author's own words and, if an English Second Language speaker, may reflect this.

This should not impact on academic outcomes for the candidate concerned, as it is just a matter of style.

Yours Sincerely,

[signed]

**Dr D.A. Barraclough**

Full Member: South African Professional Editor's Guild (PEG), and of the South African Translators Institute (SATI)

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david.barraclough@copy-writing.co.za

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