

**PRODUCTION, SAFETY AND  
TEAMWORK IN A DEEP-LEVEL  
MINING WORKPLACE**

**PERSPECTIVES FROM THE ROCK-FACE**

This page intentionally left blank

# **PRODUCTION, SAFETY AND TEAMWORK IN A DEEP-LEVEL MINING WORKPLACE**

**PERSPECTIVES FROM THE ROCK-FACE**

**BY**

**SIZWE TIMOTHY PHAKATHI**

*Chamber of Mines of South Africa, University of Pretoria's  
Gordon Institute of Business Science and University of  
Johannesburg*



United Kingdom – North America – Japan  
India – Malaysia – China

Emerald Publishing Limited  
Howard House, Wagon Lane, Bingley BD16 1WA, UK

First edition 2018

Copyright © 2018 Emerald Publishing Limited

**Reprints and permissions service**

Contact: [permissions@emeraldinsight.com](mailto:permissions@emeraldinsight.com)

No part of this book may be reproduced, stored in a retrieval system, transmitted in any form or by any means electronic, mechanical, photocopying, recording or otherwise without either the prior written permission of the publisher or a licence permitting restricted copying issued in the UK by The Copyright Licensing Agency and in the USA by The Copyright Clearance Center. Any opinions expressed in the chapters are those of the authors. Whilst Emerald makes every effort to ensure the quality and accuracy of its content, Emerald makes no representation implied or otherwise, as to the chapters' suitability and application and disclaims any warranties, express or implied, to their use.

**British Library Cataloguing in Publication Data**

A catalogue record for this book is available from the British Library

ISBN: 978-1-78714-564-1 (Print)

ISBN: 978-1-78714-563-4 (Online)

ISBN: 978-1-78714-976-2 (Epub)



ISOQAR certified  
Management System,  
awarded to Emerald  
for adherence to  
Environmental  
standard  
ISO 14001:2004.

Certificate Number 1985  
ISO 14001



INVESTOR IN PEOPLE

# CONTENTS

LIST OF FIGURES	<i>vii</i>
LIST OF TABLES	<i>xi</i>
ABOUT THE AUTHOR	<i>xiii</i>
ACKNOWLEDGEMENTS	<i>xv</i>
CHAPTER 1 INTRODUCTION	<i>1</i>
CHAPTER 2 A WORKPLACE ETHNOGRAPHY OF DEEP-LEVEL MINING TEAMS	<i>25</i>
CHAPTER 3 THE WORK PROCESS AND INFORMAL WORK PRACTICES	<i>37</i>
CHAPTER 4 MAKING A PLAN ( <i>PLANISA</i> ) AND THE WORK PROCESS AT THE ROCK-FACE	<i>69</i>
CHAPTER 5 MAKING A PLAN ( <i>PLANISA</i> ) AND THE PRODUCTION BONUS SCHEME: COOPERATION OR CONFLICT?	<i>87</i>
CHAPTER 6 GENERATIONAL DIFFERENCES AND TEAM PERFORMANCE: MILLENNIAL MINERS AND THE OLDER GENERATION	<i>123</i>
CHAPTER 7 SELF-DIRECTED WORK TEAMS AND MINING WORKPLACE PRODUCTIVITY	<i>143</i>
CHAPTER 8 FRONTLINE SUPERVISORS: CHANGE FACILITATORS OR CHANGE RESISTERS	<i>163</i>

CHAPTER 9 FRONTLINE SUPERVISION AND LEADERSHIP STYLES IN DEEP-LEVEL MINING: A TALE OF TWO SHIFT-BOSSES	183
CHAPTER 10 CONCLUSION AND REFLECTIONS: ORGANISING AND MANAGING PRODUCTION, SAFETY AND TEAMWORK: LEVERAGING PERSPECTIVES FROM THE ROCK-FACE	209
APPENDIX – PHOTO ESSAY	231
INDEX	253

# LIST OF FIGURES

## Chapter 1

Figure 1.1	Number of Employees in the South African Mining Industry, 2003–2016. . . . .	4
Figure 1.2	Number of Occupational Fatalities in the South African Mining Industry, 1993–2016. . . . .	7
Figure 1.3	Fatality Frequency Rate Per Million Hours Worked. . . . .	8
Figure 1.4	South African Mining Fatality Frequency Rates Per Million Hours Worked Compared to Australia, Canada and the United States, 2003–2016. . . . .	9
Figure 1.5	Number of Occupational Injuries in the South African Mining Industry, 1993–2016. . . . .	10
Figure 1.6	Injury Frequency Rate per Million Hours Worked. . . . .	11
Figure 1.7	Causes of Occupational Mining Fatalities, 1993–2016. . . . .	12
Figure 1.8	Causes of Occupational Injuries, 1994–2016. . . . .	13

## Chapter 5

Figure 5.1	Average Number of Person-Days Lost. . . . .	104
------------	---	-----

## Chapter 9

Figure 9.1	Square Metres of Broken Ore Achieved by Jimmy’s Production Crews. . . . .	188
Figure 9.2	Percentage of Sweepings Achieved by Jimmy’s Production Crews. . . . .	189
Figure 9.3	Square Metres of Broken Ore Achieved by Lee’s Production Crews. . . . .	189
Figure 9.4	Percentage of Sweepings Achieved by Lee’s Production Crews. . . . .	190

## Appendix

Figure A1	One of the Blocks in the Mine Hostel . . . . .	237
Figure A2	The Shaft with Production Material in the Foreground . . . . .	237

Figure A3	Production Material (Timber Packs, Props, Pipes) Being Transported from Surface to Underground . . . . .	238
Figure A4	On Their Way to Work, Underground Workers Waiting for the Sub-Shaft Cage . . . . .	238
Figure A5	Mineworkers Getting into the Sub-Shaft Cage . . . . .	239
Figure A6	Out of the Tram/Men Carriage/Locomotive, Workers Walking Towards the Waiting Place . . . . .	239
Figure A7	At the Waiting Place, the Stope Team Getting Ready for an Underground Shift . . . . .	240
Figure A8	Rock-Drill Operators Drilling the Gold-Bearing Rock (the Reef) by Means of a Pneumatic Drill . . . . .	240
Figure A9	Rock-Drill Operators Drilling the Gully Face Paving the Way to the Gold-Bearing Rock. This Is Called Development – The Process of Accessing the Ore- Body through Shafts and/or Tunnelling in Underground Mining Operations . . . . .	241
Figure A10	A Stope Worker Inside the Stope. Also Visible Is the Installation of Temporary Support Using Props. Permanent Support Is Installed Using Timber Packs. . . . .	241
Figure A11	The Author (in White Overall Sweating Profusely) and the Stope Worker . . . . .	242
Figure A12	Scraper-Winch with Which to Remove the Broken Rock. . . . .	242
Figure A13	Timber Packs in the Haulage, Underground . . . . .	243
Figure A14	An Underground Store . . . . .	243
Figure A15	Team Workers Clearing the Route Via Which the Mono-Winch Conveys Material to the Stope . . . . .	244
Figure A16	The Author Taking Part in Some of the Team’s Production Tasks . . . . .	244
Figure A17	A Team Worker Tying the Timber Pack to the Mono- Winch with a String . . . . .	245
Figure A18	A Timber Pack Being Conveyed to the Stope by the Mono-Winch. . . . .	245
Figure A19	Mineworkers Walking to the Hostel after an Underground Shift. . . . .	246
Figure A20	The Laundry in the Hostel . . . . .	246
Figure A21	The Change Room in the Hostel . . . . .	247
Figure A22	The Pots in which the Miners’ Food Is Cooked . . . . .	247
Figure A23	Mineworkers Being Served Food in the Kitchen . . . . .	248
Figure A24	Pay Day! Mineworkers Queuing in the Remuneration Office . . . . .	248

Figure A25	After Work, Miners Chilling and Playing Snooker in a Restaurant a Stone's Throw from the Hostel . . . . .	249
Figure A26	Mineworkers Playing Cards in the Hostel . . . . .	249
Figure A27	The Trade Union Rank-and-File Gather at the Arena for a Mass Union Meeting . . . . .	250
Figure A28	At the Arena in the Hostel, the Mine Manager Holding a Mass Communication Meeting on Production and Safety . . . . .	250
Figure A29	The Plant to Which the Broken Ore Is Hoisted for Milling . . . . .	251
Figure A30	Miners Performing an Enjoyable and Cheerful Traditional Dance in the Hostel . . . . .	251

This page intentionally left blank

# LIST OF TABLES

## Chapter 2

Table 2.1	AfricaGold and GoldCo Operational Safety Performance.. . . . .	33
-----------	--	----

## Chapter 5

Table 5.1	Tonnage of Gold-Bearing Ore Delivered, Week 1. . . .	111
Table 5.2	Tonnage of Gold-Bearing Ore Delivered, Week 2. . . .	111
Table 5.3	Tonnage of Gold-Bearing Ore Delivered, Week 3. . . .	112
Table 5.4	Tonnage of Gold-Bearing Ore Delivered, Week 4. . . .	112
Table 5.5	Tonnage of Gold-Bearing Ore Delivered, Week 5. . . .	112

## Chapter 7

Table 7.1	Quarterly Production Results of AfricaGold’s Mining Operations. . . . .	147
Table 7.2	SDWT Training Statistics for the Work Team ‘Tigers’ (Date Sent to Training: January). . . . .	159
Table 7.3	SDWT Training Statistics for the Work Team ‘Vultures’ (Date Sent to Training: January). . . . .	159
Table 7.4	SDWT Training Statistics for the Work Team ‘Yizwanana’ (Date Sent to Training: June). . . . .	160
Table 7.5	SDWT Training Statistics for the Work Team ‘Lions’ (Date Sent to Training: June). . . . .	160

## Chapter 10

Table 10.1	Examples of Drive and Monitor Leading Indicators for Safe Production. . . . .	216
------------	---	-----

This page intentionally left blank

## ABOUT THE AUTHOR

**Sizwe Timothy Phakathi** is Head of Safety and Sustainable Development at the Chamber of Mines of South Africa and an Employer Convenor at the Mine Health and Safety Council of South Africa. He is a Research Associate at the University of Pretoria's Gordon Institute of Business Science and in the Department of Sociology at the University of Johannesburg. Phakathi is an alumnus of the Emerging Leaders in African Mining Programme coordinated by the Minerals and Energy for Development Alliance at the University of Western Australia and University of Queensland.

Phakathi obtained his PhD from the University of Oxford, England and his Masters Degree in Industrial Sociology (*cum laude*) from the University of the Witwatersrand, Johannesburg. For his doctoral research, he lived in the mine hostel and went underground with the mining teams and frontline supervisors for a full production shift over an extended period of time.

In April 2014, Phakathi's research paper titled '*Getting On and Getting By: Gold Miners' Informal Work Practice of Making a Plan (Planisa)*' was selected by the Journal of Organizational Ethnography as the 'Most Outstanding Paper' in 2013. In 2010, prior to publication, Phakathi's paper was awarded the annual Oxford University's Ngo Future of Work (FOW) Prize. This prestigious Prize is awarded to a researcher who has contributed significantly to the growing body of knowledge enabling people to understand the future of work. In 2003, Phakathi's published journal article on '*Self-Directed Work Teams in a Post-Apartheid Gold Mine*' was selected as the 'Most Outstanding Journal Paper' in 2002 by the Editorial Team of the Journal of Workplace Learning. Phakathi has authored and co-authored a number of research reports, conference presentations, journal articles, monographs and book chapters.

This page intentionally left blank

## ACKNOWLEDGEMENTS

This book emanated from my academic life at the University of Oxford, England, as a doctoral research project. However, the journey started long before I went to Oxford as a researcher. I was involved in the DeepMine, FutureMine and CoalTech 2020 collaborative research projects conducted by the Sociology of Work Programme (SWOP) at the University of the Witwatersrand in Johannesburg under the auspices of the Council for Scientific and Industrial Research (CSIR) of South Africa. These multi-disciplinary mining research and development projects sought to investigate the feasibility of mining gold at ultra-deep levels and the development of sustainable mining practices from the point of view of frontline mineworkers. The experience and knowledge gained from these organisations moulded my insight and understanding of the business of mining and the working lives of miners at the rock-face down the mine.

First and foremost, I would like to thank the management of GoldCo and the National Union of Mineworkers (NUM) for granting me permission to conduct research at AfricaGold mine. Special thanks go to Bobby Godsell, Ian Heynes, Keratilwe Modiga, Abe Bardin, Alan Fine, Madoda Sambatha, Tafa Moya and Senzeni Zokwana, as well as to Professor Ray Durrheim and Kuseni Dlamini for their unflinching support and encouragement. The people at AfricaGold, particularly Marius Steenkamp, the Human Resources Manager, and Grant Davey, the Mine Manager, were unstinting in their support for the research presented in this book, as were the many mineworkers and other mine employees who shared their space and their time with me, as did the shop stewards, who frequently made themselves available for conversations. The hospitality they gave me while I conducted the research in the mine is greatly appreciated.

I am greatly indebted to many individuals and organisations that gave me their support and enabled me to conduct research in a deep-level mining workplace and to complete this book. A special intellectual debt is owed to Professors Colin Mills and Gavin Williams. I thank them for the invaluable intellectual support they have given me throughout my scholarly life at Oxford. In a cordial atmosphere, I have been privileged to draw upon their extensive experience in the production of knowledge.

My sincere gratitude is extended to Professors Eddie Webster and Karl von Holdt at the Society, Work and Development Institute, University of the Witwatersrand, Johannesburg, for their encouragement and unfailing support.

Professor Kammila Naidoo and the Department of Sociology at the University of Johannesburg supported the production of this book by providing me access to the university libraries. Professor Helena Barnard, Director of Research at the University of Pretoria's Gordon Institute of Business Science (GIBS) is also thanked for her support.

I wish to thank my colleague at the Chamber of Mines of South Africa, Sietse van der Woude, for his generous support that goes beyond collegueship. I am thankful to Mike Teke for being a great mentor.

I also thank Charles Laurie for the inspiration and determination during the various stages of the writing of this book and beyond the production of this book. I am also thankful to Jimmy Keketsi for his brotherly support which came in handy when I needed to relax and recharge my book writing energies.

I am grateful to Karin Pampallis for editing the book manuscript diligently and meticulously.

The support of the Commonwealth Scholarship Commission, Ernest Oppenheimer Memorial Trust and National Research Foundation (NRF) of South Africa towards the research presented in this book is also gratefully acknowledged.

Above all, my heart goes out to my family, for their unconditional support, for always being there when I needed them, for their understanding and for the confidence they have shown in me. Special thanks go to my father and mother for their love and moral support.

# CHAPTER 1

## INTRODUCTION

### ABSTRACT

*This introductory chapter provides an overview of the South African mining sector's contribution to the national economy. It also discusses the socio-economic challenges that the sector has faced in terms of operational efficiency, productivity and safety. The chapter then briefly discusses the formal and informal organisational aspects of restructuring work processes in the South African mining industry. It concludes with a synopsis of each of the chapters of this book.*

**Keywords:** Informal work practices; mining; production; safety; teamwork; workplace change

The mining sector continues to play a significant role in the development of the South African economy, both directly and indirectly, despite the global and local socio-economic challenges that have constrained its competitiveness and performance in recent years. South Africa is one of the top 10 global producers of platinum group metals, gold, coal, chromium and diamonds. Large portions of these mineral deposits remain untapped; they are located at ultra-deep levels which make them very expensive to extract without innovative mining methods. This is a challenge that the industry has embraced as an opportunity to modernise current extractive techniques and to invest in mining-related technological innovation in a manner that will make a significant contribution to the South African economy (Chamber of Mines, 2017b). In 2016, the mining sector's share of total exports accounted for an estimated 22 per cent (R288 billion) of the total mineral exports of R1.3 trillion. The contribution of mining to the country's gross domestic product (GDP) increased from R286 billion in 2015 to R306 billion in 2016. The largest contributors to mining GDP were the coal sector (25 per cent) followed by platinum group metals (PGMs) sector (22 per cent) and the gold sector (16 per cent). Other mining commodities accounted for 47 per cent when combined (Chamber of Mines, 2017a).

According to the Chamber of Mines of South Africa, total production costs amounted to R570 billion in 2016, of which 26 per cent was for labour costs and 47 per cent for intermediary input costs. The biggest intermediary input

cost drivers include petroleum and other chemicals (9 per cent), machinery and equipment (6 per cent), electricity, gas and steam (6 per cent), wholesale and retail trade (6 per cent) and transport and storage (50 per cent). On average, it is reported that intermediary input costs increased annually by 12.3 per cent over the last 10 years and by 8.2 per cent since 2000, whereas average labour costs increased by 13.2 per cent in the last 10 years and by 10 per cent in the last six years. This demonstrates the extent of the business performance pressure with which the mining firms have had to deal in the last decade (Chamber of Mines, 2017a).

The years 2014 and 2015 proved challenging for the South African mining industry due to falling commodity prices, rising operating costs, low levels of productivity, labour strikes and regulator's safety stoppages which rendered many of the mining companies loss-making. Policy uncertainty and the lack of mining regulation have also contributed to the contraction of the struggling mining sector to the detriment of much-needed mining investment, economic growth and employment creation. The industrial relation climate calmed down in 2016 as major gold, platinum and coal mining companies reached three-year wage settlements with trade unions following a costly five-month strike that took place in the platinum sector in 2014 (Chamber of Mines, 2017a).

The fluctuating economic performance of the mining sector has also been impacted by the unpredictable and volatile international marketplace under which the sector operates. The mining companies have had to deal with the falling prices of commodities, an aspect they could not control as they are not price-setters but price-takers of their commodities. The mining companies have been increasingly under pressure to ensure the economic viability of their operations in the context of increasing production costs and decreasing commodity price trends. It is reported that the gold price fell by 15 per cent in 2015, while the coal price decreased by 20 per cent, the iron ore price decreased by 21 per cent and the platinum price fell by 31 per cent (Department of Mineral Resources, 2016). Similarly, commodity exports declined by 8 per cent in 2013, by 9 per cent in 2014, by 17 per cent in 2016 and by 0.5 per cent in 2016 (Chamber of Mines, 2017b).

According to the National Treasury of South Africa, the country's mining sector paid an estimated R12.5 billion in corporate taxes in 2016 – an 11 per cent improvement over 2015. Moreover, the sector paid R3.7 billion in royalties, contributed R120 billion in total employee earnings while dividend payments decreased to R5.9 billion from the R7 billion paid in 2015 (Chamber of Mines, 2017a, 2017b).

The economic performance pressure that the sector has had to deal with is also reflected in the declining levels of employment since the mid-1980s when the sector's labour force was around 800,000. The gold sector was the leading employer until 2005, and was thereafter overtaken by the platinum sector. The gold sector labour force declined from 400,000 in 1994 to just over 100,000 in 2016. This is not surprising in light of the declining levels of gold production

and greenfield explorations. South Africa's gold output has drastically declined over the years, leading to the perception that gold mining is a 'sunset industry' – a view that has been disputed given the large volumes of untapped ore deposits still lying at ultra-deep levels, below 3,000 m.<sup>1</sup> It is for this reason that some deep-level gold mining companies have embarked on exploring human-centred technological and innovative solutions that would make it possible to mine such deep ore deposits safely and cost effectively (Creamer, 2016).

In 2016, there were 457,292 people directly employed in the mining industry, a 5 per cent decline from the previous year (Chamber of Mines, 2017a, 2017b; Department of Mineral Resources, 2017). The sector employed nearly 6 per cent of all employed people in South Africa (Chamber of Mines, 2017b). Furthermore, the mining sector indirectly created job opportunities and retained thousands of jobs in sectors such as agriculture (timber), manufacturing (steel), finance and banking (interest paid and insurance) and construction (Chamber of Mines, 2017b). Figure 1.1 shows levels of employment across the different commodities. In 2016, the biggest employment contributors were platinum with 172,444 people, followed by the gold sector with 116,480 people and coal sector with 77,506 people. Compared to 2015, there were job losses in all other commodities except in gold, diamonds and aggregate and sand commodities.

## **OCCUPATIONAL HEALTH AND SAFETY INITIATIVES IN SOUTH AFRICAN MINES**

Accidents in South African mines remain a cause for concern. While there has been a reduction in the number of occupational fatalities and injuries since 1993, there is much more work to be done to achieve the industry goal of zero harm. The advent of democracy and the reintegration of South Africa's economy into the global economy led to an increased focus on improving the occupational health and safety (OHS) performance in the mining industry. Over the years, a plethora of initiatives has been introduced to improve mine health and safety performance.

The post-apartheid mining order saw the enactment of the new Mine Health and Safety Act (MHSA) in 1996, following the findings and recommendations of the 1995 Leon Commission of Inquiry into health and safety in the South African mining industry. One of the recommendations of the Commission resulted in the establishment of the Mine Health and Safety Council (MHSC) in 1998 – a tripartite institution, comprising stakeholders from government, organised business and organised labour. The MHSC advises government, facilitates research and the adoption of research outcomes pertaining to mine health and safety (Republic of South Africa, 1996).

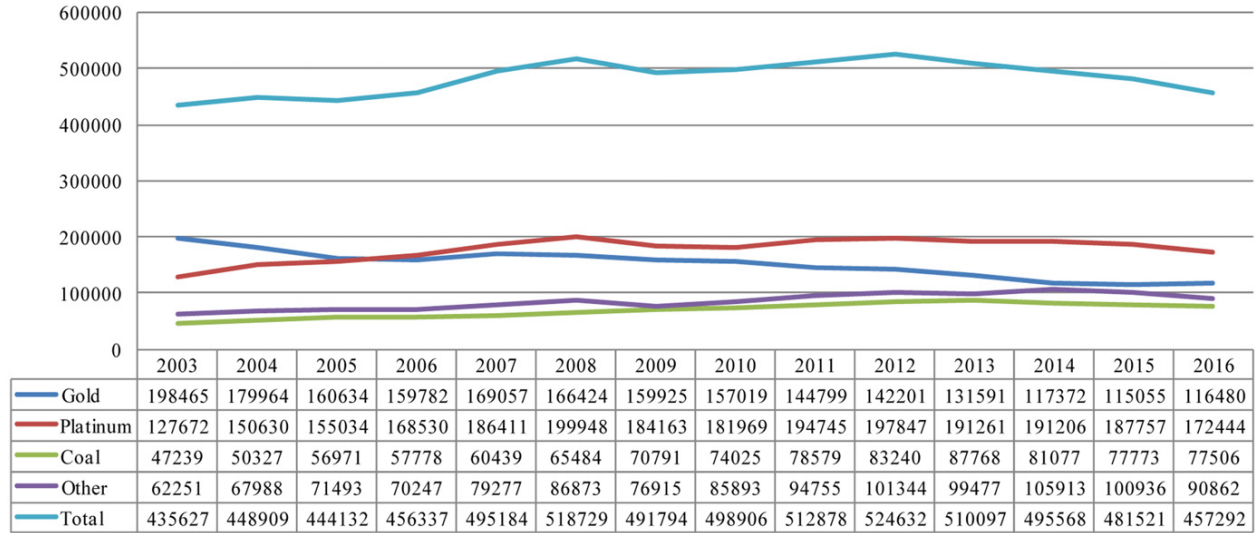


Figure 1.1: Number of Employees in the South African Mining Industry, 2003–2016. *Source:* Department of Mineral Resources (2017) and Chamber of Mines (2017a).

Following many of years of disappointing OHS performance, in 2003 government, organised business and organised labour collaboratively reached a 10-year milestone-based agreement. This agreement sought to ensure that every mineworker returned from work unharmed every day by improving industry OHS performance to levels comparable to international benchmark levels of mining countries including Australia, Canada and the United States. To achieve this by 2013, the tripartite stakeholders agreed on an annual target of 20 per cent reduction in occupational fatalities.

In 2008, industry stakeholders developed a Tripartite Action Plan to ensure achievement of the 2013 milestones. The Action Plan comprised a variety of initiatives including training of OHS representatives and improving the OHS culture in the mining industry. In 2009, the Chamber of Mines launched the Mining Occupational Safety and Health (MOSH) Learning Hub to help mining companies learn from pockets of excellence in the industry. Since its inception, the MOSH Learning Hub has facilitated the identification, adoption and implementation of OHS leading practices including an entry examination, mining with nets and bolts to prevent injuries related to rockfalls, installation of proximity detection systems (PDS) to prevent and manage transport-related accidents, quietening drilling machines to reduce noise-induced hearing loss and dust suppression systems to prevent dust-related illnesses among miners (Chamber of Mines, 2016).

In 2010, against the backdrop of a disappointing level of industry OHS performance, health and safety provisions were included in the Mining Charter. This meant that the mining companies had to report annually on their performance against the health and safety provisions of the Mining Charter. Owing to the realisation of the importance of a positive health and safety culture on South African mines, at the 2011 Mine Health and Safety Summit, tripartite industry stakeholders approved the Culture Transformation Framework for the South African mining sector (MHSC, 2011, 2014). In 2012, the Chamber of Mines established the Chief Executive Officer (CEO) Elimination of Fatalities Team. This acknowledged the importance of leaders to ‘walk the health and safety talk’ and demonstrated visible commitment to the industry’s quest for zero harm. The first safety focus area of this initiative was to effectively control risks related to falls of ground because it was historically the biggest contributor to occupational fatalities. The other focal areas covered by the Team included effective management of collision between rail-bound and trackless mobile machinery, noise-reduction, dust suppression, prevention of occupational diseases, management of catastrophic events and behavioural change through transformation of workplace safety culture.

In 2014, industry tripartite stakeholders agreed on a set of 10-year milestones to eliminate occupational of fatalities by 2020 and reduce occupational injuries by 20 per cent per year. At the biennial Mine Health and Safety Summit held in 2016, the stakeholders recommitted themselves to

accelerating the achievement of the industry goal of zero harm. The declaration of actions includes visible leadership and relationship building to address the trust deficit among tripartite stakeholders, improving communication across all organisational levels to ensure that the message of zero harm reaches all mine employees and contractors, empowerment of frontline supervisors and employees and annual company health and safety days (Chamber of Mines, 2017a).

## **SAFETY PERFORMANCE IN SOUTH AFRICAN MINES**

There has been a significant reduction in occupational fatalities in the South African industry since 1994 (see [Figure 1.2](#)). Fatalities have been reduced by 88 per cent from 615 in 1993 to 73 in 2016. The industry fatality frequency rates per million hours worked show a steady improvement in safety performance (see [Figure 1.3](#)) (Chamber of Mines, 2017a; Department of Mineral Resources, 2017). However, the last three years show that the industry's downward trend in safety performance has plateaued.

An analysis of international mining fatality frequency rates per million hours worked showed South Africa's safety performance was comparable to Australia, Canada and the United States (see [Figure 1.4](#)). South Africa's safety performance improvement is remarkable given the challenging geological conditions associated with depth of mining, and the use of labour-intensive and conventional mining methods, which are generally less safe than mechanised methods.

As shown in [Figure 1.5](#), the total number of occupational injuries reported annually remains unacceptably high in the South African mining industry. In 2014 and 2016, the industry substantially reduced the number of serious injuries reported to below 3,000. The low number of injuries recorded in 2014 was influenced by the five-month strike that took place in the platinum industry. The injury frequency rates per million hours worked show a lacklustre performance. In response to this disappointing trend, the industry stakeholders agreed at the 2014 Mine Health and Safety Summit to reduce occupational injuries by 20 per cent per year from January 2016 onwards ([Figure 1.5](#)).

As shown in [Figures 1.2 and 1.5](#), the gold sector has been the biggest contributor to occupational fatalities and injuries, followed by the platinum sector. [Figures 1.7 and 1.8](#) show that fall of ground, transport and machinery have been major causes of occupational fatalities and injuries. Accidents are also caused by falling from heights, slipping and falling, inhaling dangerous fumes, being struck by an object, explosives, inundation and mud-rush.

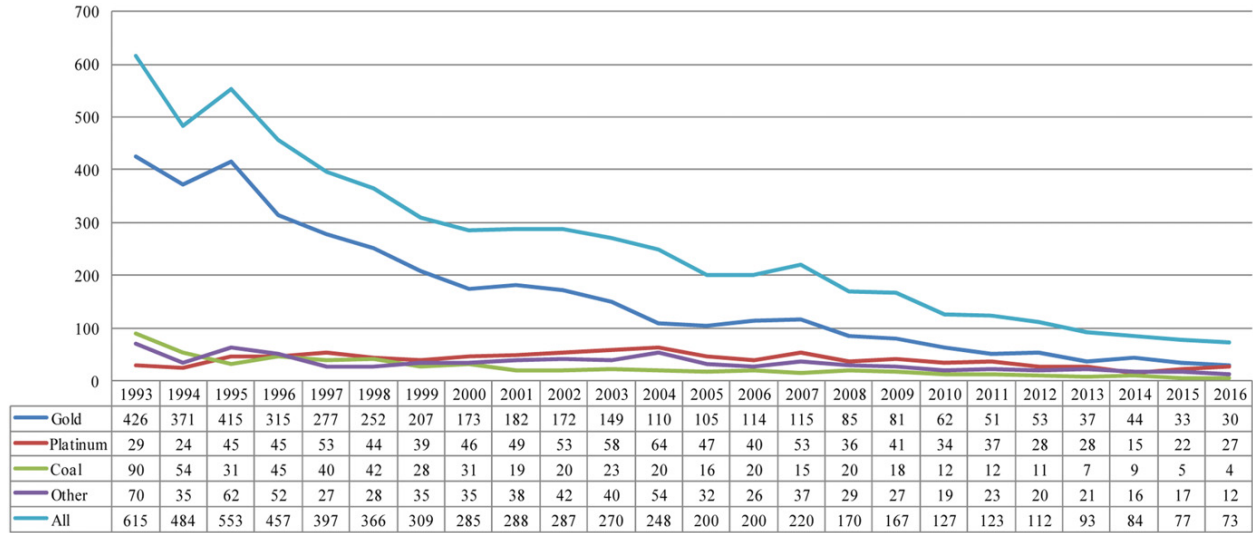


Figure 1.2: Number of Occupational Fatalities in the South African Mining Industry, 1993–2016. Source: Department of Mineral Resources (2017) and Chamber of Mines (2017a).

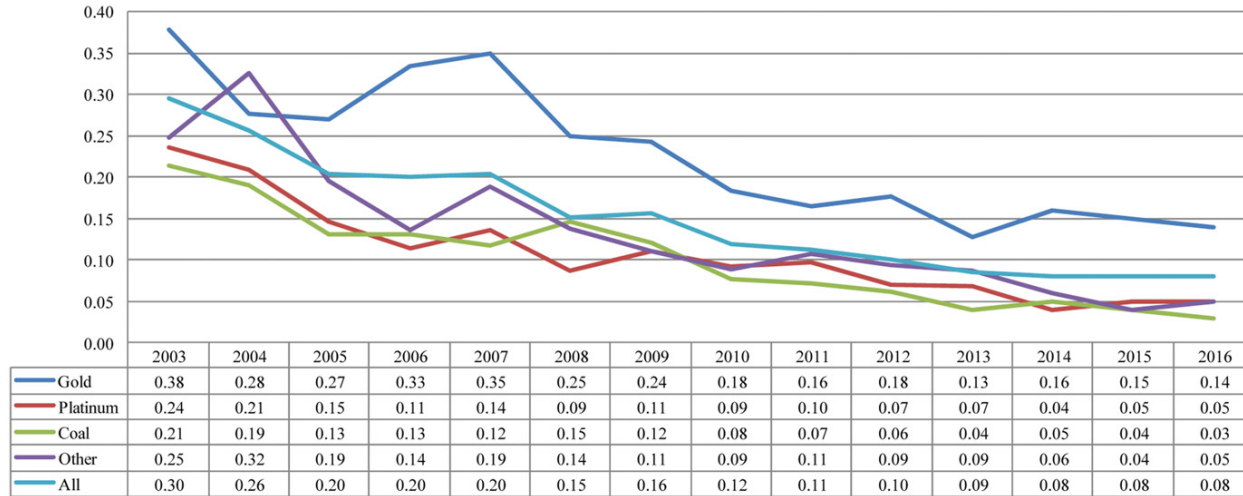


Figure 1.3: Fatality Frequency Rate Per Million Hours Worked. *Source:* Department of Mineral Resources (2017) and Chamber of Mines (2017a).

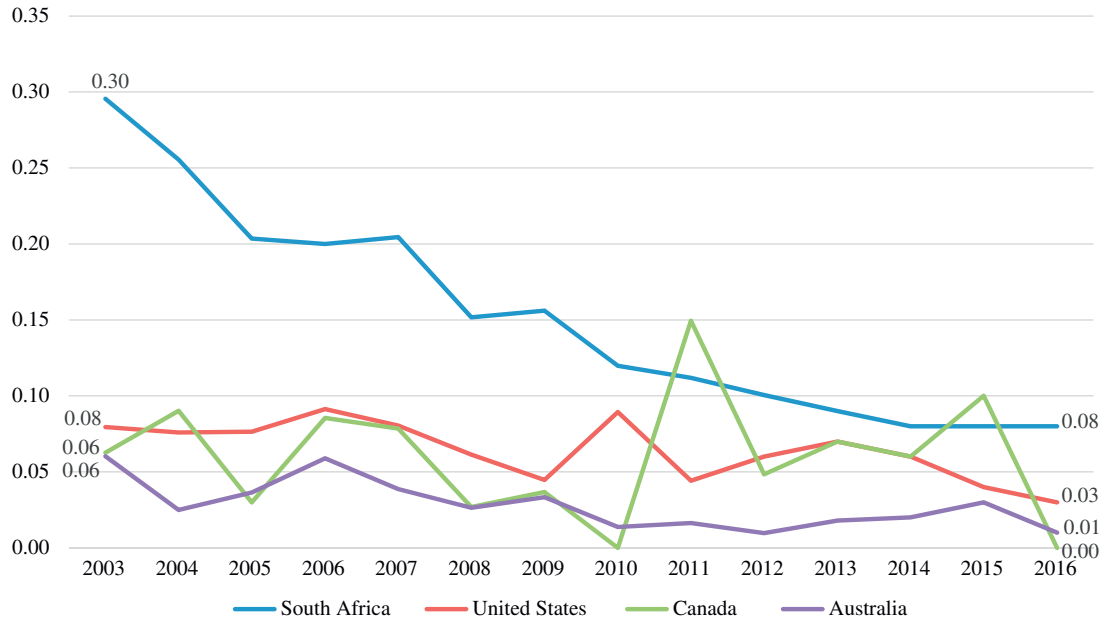


Figure 1.4: South African Mining Fatality Frequency Rates Per Million Hours Worked Compared to Australia, Canada and the United States, 2003–2016. Source: Chamber of Mines (2016).

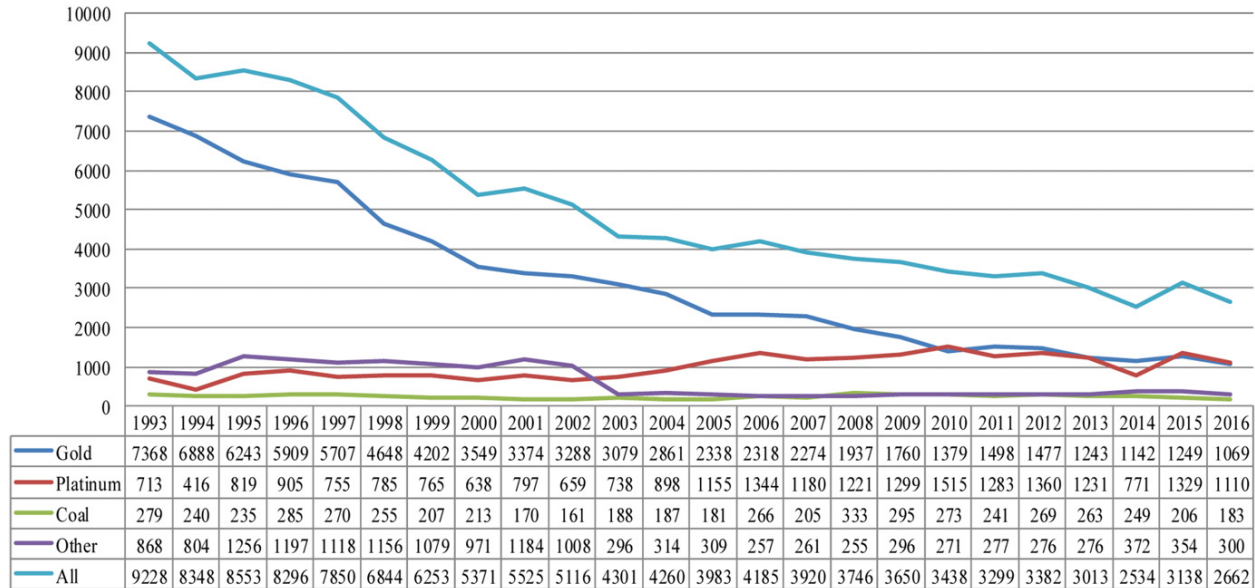


Figure 1.5: Number of Occupational Injuries in the South African Mining Industry, 1993–2016. *Source:* Department of Mineral Resources (2017) and Chamber of Mines (2017a).

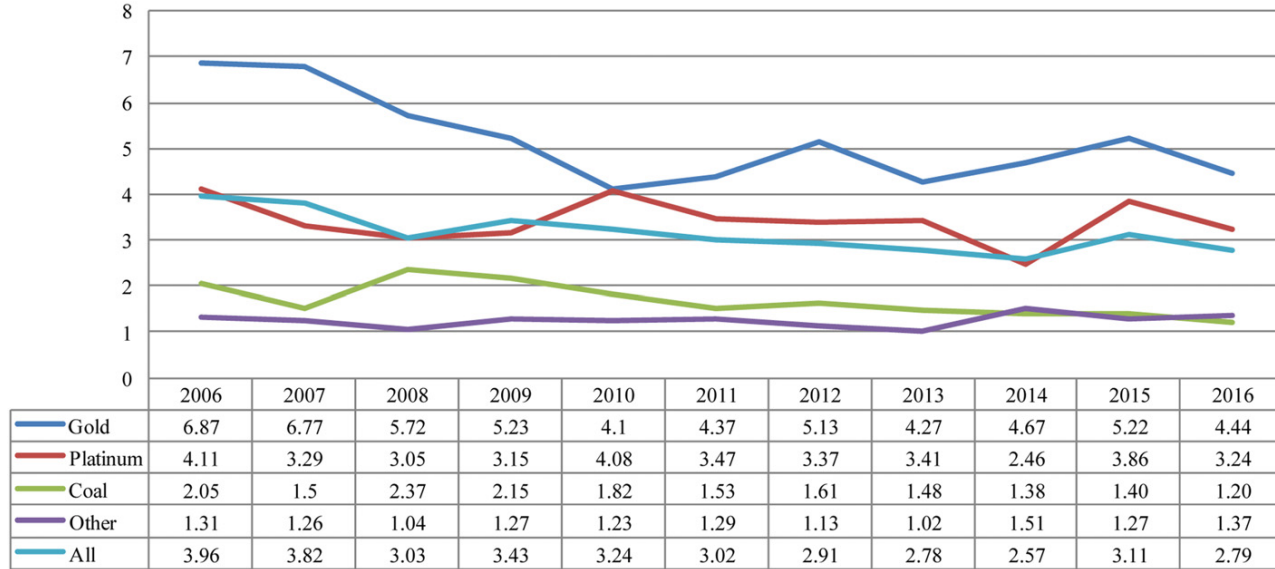


Figure 1.6: Injury Frequency Rate per Million Hours Worked. Source: Department of Mineral Resources (2017) and Chamber of Mines (2017a).

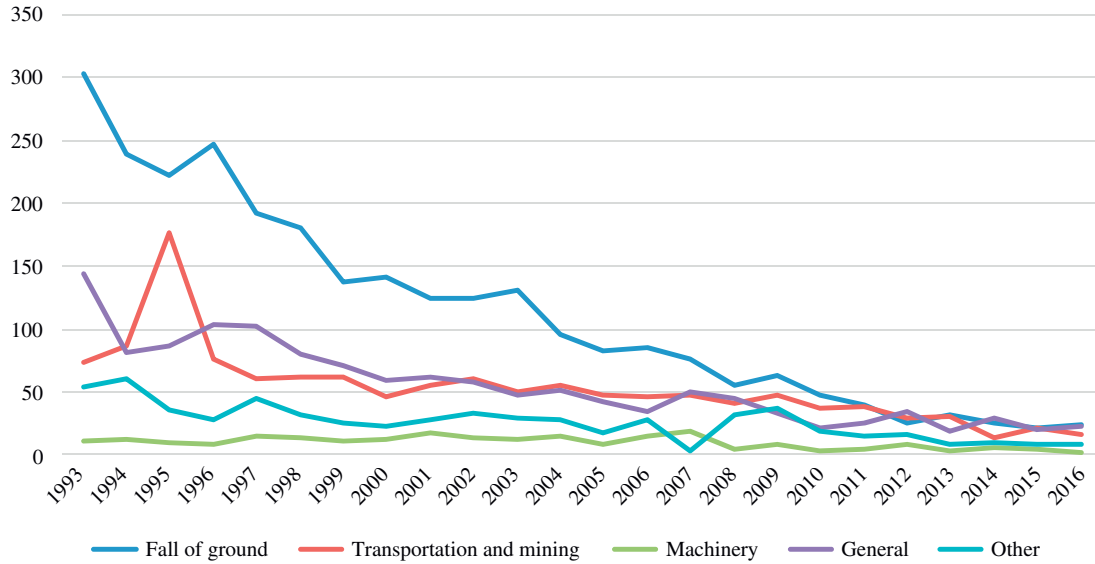


Figure 1.7: Causes of Occupational Mining Fatalities, 1993–2016. Source: Department of Mineral Resources (2017) and Chamber of Mines (2017a).

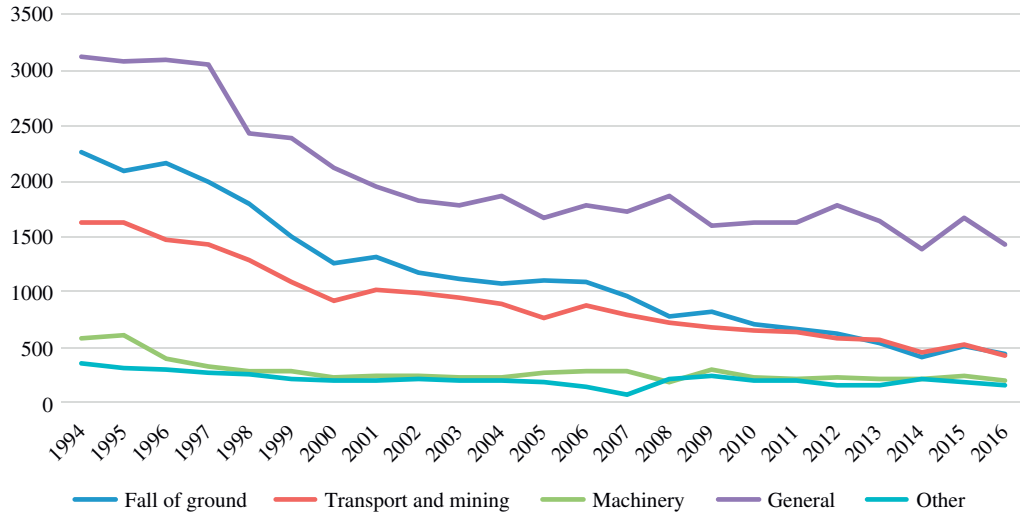


Figure 1.8: Causes of Occupational Injuries, 1994–2016. Source: Department of Mineral Resources (2017) and Chamber of Mines (2017a).

## **REORGANISATION OF WORK PROCESSES AND WORKPLACE PRACTICES IN SOUTH AFRICAN MINES**

Like many organisations around the world that seek to improve business performance, the extractives industry is no exception. Faced with the fiercely competitive global economy, declining commodity prices, increasing operating costs, low volumes of production, low levels of productivity, a moral obligation to improve OHS performance and the importance of gaining a social licence to operate, South African mining firms have introduced a variety of workplace change initiatives to increase operational efficiency, productivity and safety. As one CEO of a deep-level gold mining company remarked:

Work structures have remained remarkably unchanged for many decades because of static technology, the impact of apartheid and the previously closed nature – in times past – of the South African economy. We now face the transition from a Taylor-type of work structure or Fordism, as is called in sociology of work terms, to models more appropriate for an information-driven society (quoted in Webster, Moodie, Stewart, & Psoulis, 1999, p. 23).

Mining companies have introduced a cocktail of initiatives to re-engineer work processes in order to elicit heightened levels of organisational, employee and team performance. The reorganisation of work and inculcation of a high-performance culture at the rock-face down the mine entailed reviewing the existing modes of work organisation, redesigning and introducing innovative forms of teamwork and performance-based incentive systems (Bacon & Blyton, 2005; Barker, 1993, 1999; Delbridge, Thurnbull, & Wilkinson, 1992; Jones, Kalmi, & Kauhanen, 2010; Procter & Mueller, 2000), frontline worker involvement (Gee, Hull, & Lankshear, 1996; Marchington, Wilkinson, Ackers, & Goodman, 1994; Smith, 1996, 1997; Walton, 1985) and efficient forms of frontline supervision (Currie & Procter, 2001, 2005; Delbridge & Lowe, 1997; Fenton-O’Creavy, 1996, 2001; McGovern, Hope-Hailey, & Stiles, 1998; Whittaker & Marchington, 2003).

This book examines the reactions of frontline mining teams, supervisors, middle managers and top managers to the implementation of workplace change initiatives at AfricaGold<sup>2</sup> – a deep-level gold mine situated near the towns of Orkney and Klerksdorp, 180 km southwest of Johannesburg in South Africa (see Chapter 2).

Some workplace studies hail the new forms of work reorganisation for eroding the rigid and bureaucratized forms of work organisation that stifle worker discretionary effort and productivity on the shop-floor. On the other hand, other studies claim that the hegemony of work reorganisation has weakened the capacity of shop-floor workers to maintain control over the work process through what some writers have called concertive control (Barker, 1993, 1999) or management-by-stress (Parker & Slaughter, 1990, 1993).

The reorganisation of work processes is largely designed and introduced by top management. The implementation of new work systems on the shop-floor takes place in accordance with a defined set of prescriptions, procedures,

standards and checklists that frontline employees and supervisors ought to follow if they are to produce the expected levels of organisational and team performance. More often than not, the success of these work systems is attributed to formal execution of their prescriptions, procedures and checklists by frontline employees. Ironically, in the event that the work systems fail to live up to expectations, such failure is attributed to shop-floor resistance to workplace change initiatives as defined in the work process manuals.

The reality is that implementation of workplace change initiatives does not solely occur through formalised work procedures, standards, prescription and checklists. While acknowledging the merits of formalised work methods, **Chapter 3** highlights numerous instances in various organisational settings where standardised work practices failed to produce the envisaged organisational performance outcomes on the shop-floor (see also Bourrier & Bieder, 2013; Dekker, 2014; Katzenbach & Khan, 2010; Reason, Parker, & Lawton, 1998). In such instances, the prescribed rules and procedures tended to be counterproductive and had to be rescued through the informally learned and acquired working knowledge and practices of shop-floor operators and, to some extent, frontline supervisors.

In situations where the prescribed work systems are not aligned with the day-to-day realities of the work process and do not meet the expectations in improving the welfare of shop-floor workers, they can simply be resisted by frontline workers and supervisors to the detriment of organisational and team performance (see Chapter 5). It is for this reason that the outcomes of workplace change programmes on the shop-floor, whether successful or unsuccessful, should be understood as influenced by the interplay of formalised work prescriptions and informal work practices that are often invisible to the eyes of top management and the designers of work processes (Bourrier & Bieder, 2013; Dekker, 2014; Fucks & Dien, 2013; Hale & Borys, 2013a; Katzenbach & Khan, 2010).

A number of labour process, workplace and occupational safety studies have shown the interaction between formal (official) and informal (unofficial) work arrangements (Ackroyd & Thompson, 1999; Barker, 1993, 1998, 1999; Bolton & Houlihan, 2009; DeJoy, 2005; Dekker, 2003; Gouldner, 1952; Iszatt-White, 2007; Jagtman & Hale, 2007; Merton, 1949; Reason, 1998; Richards, 2008; Roy, 1952, 1954). These studies show that shop-floor workers do not always achieve production goals through bureaucratised work strategies. Where formal or bureaucratised work methods fail to overcome production bottlenecks, shop-floor workers bypass official work standards and adopt informal work strategies in order to restore production. This raises questions about the efficiency of formalised work methods in certain work situations (Burawoy, 1979; Dekker, 2014; Gouldner, 1954; Hale & Borys, 2013a; Merton, Gray, Hockey, & Selvin, 1952; Reason et al., 1998; Roy, 1953).

The variety of ways through which frontline workers resist or facilitate the intentions of workplace change practices has to a large extent been neglected by proponents of new managerial regimes. The agency of shop-floor workers in

reinterpreting and reshaping workplace change processes and management initiatives in ways that make sense to them and enable them to maintain control over work process should not be overlooked if we are to fully understand the outcomes of workplace change programmes on organisational, employee and team performance. As [Vallas \(2006, p. 1678\)](#) points out:

Because existing approaches have largely focused on the nature of managerially initiated work structures, they have often elided the role played by human agency – specifically, the ways in which workers understand and respond to the changes they confront. As a result, we have only the most limited understanding of how workers view various managerial initiatives and of the ways in which the new production concepts might be resisted or reshaped. Nor can we speak with confidence about the degree to which the empowerment of workers, where this occurs, might rest on initiatives and meanings that are supplied by the workers themselves.

This book seeks to make a contribution within the context of the neglected role of the agency of shop-floor employees and frontline supervisors in managerially defined work structures. As [Hodson \(2001, p. 265\)](#) argues:

Workers' struggles [for control in the workplace] are often the decisive factor in highlighting the contradictions and limitations of an existing organisation of production and forcing the development of new, more humane and more efficient ways of organising work.

Frontline workers do not accept management initiatives naively but are critical of and reshape these agendas on their own terms ([Bolton & Houlihan, 2009](#); [Hyman, 1987](#); [Rinehart, 1984](#); [Vallas, 1999, 2003a, 2003b, 2006](#); [Vallas & Beck, 1996](#)). Shop-floor employees are aware that 'when modern working practices are implemented they can alter work in unintended ways, have deleterious effects on employees and not produce the hoped for improvements in employee and organisational performance' ([Holman, Wall, Clegg, Sparrow, & Howard, 2005, p. 1](#)). While acknowledging the merits and contribution of formalised rules to workplace safety improvement through standardisation, reduction in harm, predictability and transparency control, writers such as [Dekker \(2014\)](#), [Reason \(1998, 2008\)](#) and [Reason et al. \(1998\)](#) maintain that the bureaucratisation of safety rules can stifle creativity, improvisation, innovation and worker freedom on the shop-floor. These authors argue that contemporary high-risk organisations such as aviation, mining, oil and gas have been characterised by over-regulation, quantification, formalisation, proceduralisation and bureaucratisation of safety.

To ensure compliance with regulation and avoid liabilities associated with the catastrophic effects of occupational accidents, contemporary organisations have designed and introduced a plethora of standardised administrative controls in the form of prescriptions, checklists, guidelines, toolkits, questionnaires, dashboards, audits and contracting. It is these numerous administrative controls that have led to the increasing trend of bureaucratisation of safety that has overlooked the tacit knowledge, experience, skills, expertise, discretion, creativity and agility of the operator at the shop-floor level. Bureaucratized workplace safety rules can be toxic to safety if there is over-reliance on their administrative controls. As discussed in detail in Chapter 3, they are not a

panacea in the complex, unpredictable and uncertain organisational circumstances encountered by shop-floor operators. Hence, the operators' deviation from formalised work rules in certain operational contexts on the basis of their practical experience and judgement of the complexity of the work process situation at hand (Dekker, 2003, 2014; Hale & Borys, 2013a; Pelegrin, 2013; Reason, 1998, 2008; Reason et al., 1998). A detailed discussion of the interaction between formalised and informal practices and the significance of this for shop-floor efficiency, productivity, safety and work relations is provided in Chapter 3 (see also Chapter 10).

## THE CONTRIBUTION OF THIS BOOK

The question at the heart of this book is why and under what conditions did frontline mining teams and supervisors resist or facilitate managerially designed workplace change initiatives in the day-to-day running of the production process inside the pit? By ethnographically investigating frontline miners' own statements, interpretations and experiences of managerially defined workplace change initiatives, this book shows that frontline miners are not passive but are critical recipients and shapers of organisational change practices. The subjective meanings the miners attach to their lived experience of deep-level mining work processes are what this book seeks to illuminate and how these mineworker subjective experience relates to the broader organisational work practices and processes in a deep-level mining workplace. Collinson (2003, p. 529) notes that worker subjectivity 'can be understood as a complex, contradictory, shifting and discursive outcome of a set of narratives that is generated by individuals in their working practices'. It is envisaged that the perspectives from the rock-face presented in this book will offer valuable insight to improving the quality of the working life and business performance in contemporary organisations.

There is a dearth of African mining labour process and critical management studies in the extant management, organisational behaviour and sociology of work literatures. The book uniquely and robustly interweaves the social and technical aspects that shape organisation and management of production, safety and teamwork down the mine. It is envisaged that this book will enhance our understanding of the changing nature of the work process and its impact on the working lives of frontline mineworkers in a twenty-first century mining workplace. The frontline miners' informal practice of 'making a plan' (*planisa*) suggests that standardised procedures and regulations are not always appropriate in complex work situations. Making a plan inside the pit indicates that the frontline miners are creative and resilient beings capable of maintaining control over production by resolving bottlenecks in the day-to-day extraction of the mineral-bearing rock.

The very existence of *planisa* raises questions about the adequacy of formalised work procedures in ensuring a reliable, safe production system. *Planisa*

does not only have implications for safe production but also for the manner in which the role of organisational, managerial, behavioural and human factors are robustly examined, understood and addressed in the quest for heightened levels of organisational efficiency, productivity, safety and work relations at the rock-face deep down the mine.

## THE STRUCTURE OF THE BOOK

The remainder of this book proceeds as follows:

**Chapter 2** provides a narrative of how the data presented in this book came about. The workplace ethnography entailed the author living in the mine hostel, observing and participating in the production tasks of the underground mining teams for a full production shift for a period stretching over six months. The chapter discusses the day-to-day running of the production process at rock-face. This section of the chapter is important for understanding the organisation of the production cycle and the actions of the mining teams, foremen and managers to ensure the smooth daily running of the production process inside the pit. Furthermore, the chapter presents an overview of the business performance of the mining workplace in terms of employment, production and operational safety.

**Chapter 3** provides an extensive review of literature on informal working practices in various organisations. The aim of the chapter is to elucidate the organisational, managerial and social processes that give rise to informal organisational practices and strategies at the point of production, not only at worker level but also at supervisory and managerial levels. This chapter helps the reader to understand the informal work practice of making a plan (*planisa*) in a deep-level mining workplace.

**Chapter 4** is the first of six empirical chapters that provide a nuanced interrogation of the miners' informal work practice in a deep-level mining workplace. This chapter sets the scene and tone for the arguments and discussion made in the remaining chapters of the book. More specifically, the empirical findings of this chapter interrogate the triggers of *planisa* and how these triggers enhance our understanding of the factors that shape the occupational culture of the mining teams. The chapter presents and discusses a host of organisational, human and managerial factors that influence the miners' underground work practice.

**Chapter 5** highlights the unintended outcomes of the production bonus scheme the mine had instituted to increase the productivity of the frontline mining teams. This is crucial given that the maladministration of the bonus system could lead to a range of unintended consequences such as deteriorating levels of trust between management and frontline workers, prioritisation of

production at the expense of safety and hiding of accidents. There are a number of organisational, management and labour factors that can render a production bonus scheme effective or ineffective. These factors influence the nature and extent of worker reactions to the bonus scheme. This chapter examines and discusses the factors that influenced the reaction of the mining teams to the team-based production bonus scheme and the extent to which mine management fulfilled its side of the bargain in the implementation of the production bonus.

The chapter highlights the manner in which the team-based bonus system influenced the production teams to engage in their informal organisational practice of making plan in order to offset the snags that jeopardised their prospects of earning the production bonus. The chapter reveals that, to a large extent, the productivity bonus generated conflict rather than consent. As a result, the incentive scheme failed to live up to expectations by not eliciting the desired levels of worker performance and productivity at the rock-face.

**Chapter 6** provides an inside account of the impact of generational differences on team performance in a manner that compelled the mining teams to make a plan. In this context, making a plan is a work strategy the mining teams adopted to offset the adverse impact of intergenerational conflict on their team performance and on their prospects of earning the production bonus. The chapter highlights work group dynamics that generated conflict between the older and younger generations of frontline mineworkers. The chapter argues that at the heart of the intergenerational conflict was their orientation towards work and management decisions. This shows the impact that the society has in shaping the differences across generations. The chapter examines intergenerational conflict within the mining teams as a work and organisational phenomenon rather than simply from a birth cohort perspective. It examines the four generations working side-by-side in the contemporary world of work – Veterans, Baby Boomers, Generation X and Generation Y (Millennials). It locates the clash of older and younger generations of miners and their generational identities in the historical, national and social contexts shaping the employment relationship, managerial strategies, work practices and production culture of apartheid and post-apartheid deep-level mining.

**Chapter 7** discusses *planisa* in the context of the relationship between teamwork training that was provided to the mining teams above the ground and its implementation underground. The training programme was essentially about empowering and transforming frontline mining teams to self-directed work teams (SDWT) to understand the gold mining business through the eyes of management. Its aim was to create new kinds of mineworkers who understood the what, how and why of the twenty-first century mining business. AfricaGold sought to reorganise the underground mining workplace through SDWT training in order to create a congenial, humane, democratic and more meaningful

form of work processes, which permitted the mining teams to have greater flexibility in the production tasks they performed. In so doing, the mine management envisaged that the transformation of worker attitudes towards the organisational goals would increase productivity.

The chapter reveals that the SDWT training seemed to have motivated the mining teams. Interestingly enough, this motivation tended to prevail even in situations of production bottlenecks. At the heart of this motivation was the miners' organisational practice of making a plan. It is arguable that the SDWT training enhanced the desire of the mining work teams to make a plan in response to production blockages and managerial inefficiencies. This is essentially what the training aimed to do – to create new kinds of frontline mine-workers who are committed to achieving the productivity goals of a modern mining workplace. Ironically, the management of production did not seem to complement the inspiration and energy that the training instilled in the minds and hearts of the mining teams.

Following on from the earlier chapters which highlighted the collusion of frontline supervisors in the perpetuation of the miners' informal work strategy of making a plan, **Chapter 8** argues that the mismanagement of production does not only affect frontline mining teams but also frontline production supervisors. The efficiency of frontline supervisors and their charges depends on the support they receive from top management. This chapter examines the changing nature of frontline supervision in the light of a three-day supervisory training course which was instituted to improve operational efficiency, productivity and safety at AfricaGold. The chapter assesses the extent to which the frontline supervisory training programme was implemented in the underground mining workplace.

**Chapter 9** examines the miners' occupational culture of *planisa* at the level of supervisor–worker relations. The chapter presents a tale of two frontline production supervisors or shift-bosses as they were called on the mine – Jimmy and Lee. In this context, the ability of the production supervisor to make a plan in ways that enhance the social organisation of the production process and people management is crucial to the development of a reciprocal working relationship. The chapter argues that *planisa* also entails a valuable social organisational skill through which frontline supervisors could effectively manage work group dynamics and team performance, intra-team conflict, effort bargain, resistance and output restriction.

The chapter reveals that by 'getting on and getting by' with his charges – going an extra mile to make plan for his mining teams wherever possible – Jimmy created a working environment that enabled his subordinates to achieve their production targets and thus earn the much-desired productivity and safety bonuses. The case of Jimmy and his charges highlights the role of the frontline supervisor as a vital agent of workplace change that elicits worker cooperation and support for new work processes, not for the sake of pleasing management but in ways that

benefit and make sense to them – going above and beyond organisational requirements to achieve the organisational performance goals at the point of production. The case of Lee, another frontline supervisor, demonstrates the opposite and highlights the toxicity of poor supervisor–worker relations to the achievement of organisational, employee and team performance goals.

**Chapter 10**, the concluding chapter, does not only summarise the key discussions and arguments of the preceding chapters but also reflect on the social, technical, organisational and human factors shaping the miners' reactions to the restructured and formalised deep-level mining work processes and their unofficial job tactic of making a plan (*planisa*). The chapter provides suggestions on how the perspectives from the rock-face as presented in this book could be leveraged and the positive aspects of the miners' job tactic of making a plan could be harnessed towards efficient, productive and safer working practices at the point of production down the mine.

## NOTES

1. According to the Chamber of Mines (2017b), South Africa's share of global gold production stood at 4.4 per cent in 2016 and had the third largest gold reserves at 6000 tonnes after Russia at 8000 tonnes and Australia at 9500 tonnes.
2. Pseudonym.

## REFERENCES

- Ackroyd, S., & Thompson, P. (1999). *Organizational misbehaviour*. London: Sage.
- Bacon, N., & Blyton, P. (2005). Worker responses to teamworking: Exploring employee attributions of managerial motives. *The International Journal of Human Resource Management*, 16(2), 238–255.
- Barker, J. R. (1993). Tightening the iron cage: Concertive control in self-managing teams. *Administrative Science Quarterly*, 38(3), 408–437.
- Barker, J. R. (1998). Tightening the iron cage: Concertive control in self-managing teams. In J. Van Maanen (Ed.), *Qualitative studies of organizations: The administrative science quarterly series in organization theory and behaviour*. London: Sage.
- Barker, J. R. (1999). *The discipline of teamwork: Participation and concertive control*. London: Sage.
- Bolton, S. C., & Houlihan, M. (2009). Beyond the control-resistance debate: A fresh look at experiences of work in the economy. *Qualitative Research in Accounting and Management*, 6(1/2), 5–13.
- Bourrier, M., & Bieder, C. (2013). Trapping safety into rules. In C. Bieder & M. Bourrier (Eds.), *Trapping safety into rules: How desirable or avoidable is proceduralization?* Surrey: Ashgate.
- Burawoy, M. (1979). *Manufacturing consent: Changes in the labour process under monopoly capitalism*. London: University of Chicago Press.
- Chamber of Mines of South Africa. (2016). *Integrated Annual Report 2015*. Johannesburg: Chamber of Mines of South Africa. Retrieved from <http://www.chamberofmines.org.za>
- Chamber of Mines of South Africa. (2017a). *Integrated Annual Report 2016*. Johannesburg: Chamber of Mines of South Africa.
- Chamber of Mines of South Africa. (2017b). *Facts and figures 2016*. Johannesburg: Chamber of Mines of South Africa.

- Collinson, D. (2003). Identities and insecurities: Selves at work. *Organization*, 10(3), 527–547.
- Creamer, M. (2016). Modernisation of South Africa's mines crucial to extending precious metals mining. *Mining Weekly*, 9 September. Retrieved from <http://www.miningweekly.com/article/modernisation-crucial-to-extending-precious-metals-mining-2016-09-09>
- Currie, G., & Procter, S. J. (2001). Exploring the relationship between HR and middle managers. *Human Resource Management Journal*, 11(3), 53–69.
- Currie, G., & Procter, S. J. (2005). The antecedents of middle managers' strategic contribution: The case of a professional bureaucracy. *Journal of Management Studies*, 42(7), 1325–1356.
- DeJoy, D. M. (2005). Behavior change versus culture change: Divergent approaches to managing workplace safety. *Safety Science*, 43(2), 105–129.
- Dekker, S. W. A. (2003). Failure to adapt or adaptations that fail: Contrasting models on procedures and safety. *Applied Ergonomics*, 34(3), 233–238.
- Dekker, S. W. A. (2014). The bureaucratization of safety. *Safety Science*, 70(December), 348–357.
- Delbridge, R., & Lowe, J. (1997). Manufacturing control: Supervisory systems on the new shop-floor. *Sociology*, 31(3), 409–426.
- Delbridge, R., Thurnbull, P., & Wilkinson, B. (1992). Pushing back the frontiers: Management control and work intensification under JIT/TQM factory regime. *New Technology, Work and Employment*, 7(2), 97–106.
- Department of Mineral Resources (DMR). (2016). *Statement by the Minister of Mineral Resources. Honourable Mr Mosebenzi J. Zwane (MP), on the 2015 Health and Safety Statistics.* Pretoria, Republic of South Africa.
- Department of Mineral Resources (DMR). (2017). *Statement by the Minister of Mineral Resources. Honourable Mr Mosebenzi J. Zwane (MP), on the 2016 Health and Safety Statistics.* Pretoria, Republic of South Africa.
- Fenton-O'Creedy, M. P. (1996). The middle manager: Friend or foe of employee involvement? *Journal of Applied Management Studies*, 5(1), 47–62.
- Fenton-O'Creedy, M. P. (2001). Employee involvement and the middle manager: Evidence from a survey of organizations. *Journal of Organizational Behaviour*, 19(1), 67–84.
- Fucks, I., & Dien, Y. (2013). 'No Rule, No Use'? The effects of over-proceduralization. In C. Bieder & M. Bourrier (Eds.), *Trapping safety into rules: How desirable or avoidable is proceduralization?* Surrey: Ashgate.
- Gee, P., Hull, G., & Lankshear, C. (1996). *The new work order: Behind the language of new capitalism.* Sydney: Allen & Unwin.
- Gouldner, A. W. (1952). Red tape as a social problem. In R. K. Merton, A. P. Gray, B. Hockey, & H. C. Selvin (Eds.), *Reader in bureaucracy.* Glencoe: Free Press.
- Gouldner, A. W. (1954). *Patterns of industrial bureaucracy.* New York, NY: Free Press.
- Hale, A., & Borys, D. (2013a). Working to rule or working safely: An introduction. In C. Bieder & M. Bourrier (Eds.), *Trapping safety into rules: How desirable or avoidable is proceduralization?* Surrey: Ashgate.
- Hodson, R. (2001). *Dignity at work.* Cambridge, MA: Cambridge University Press.
- Holman, D., Wall, T. D., Clegg, W. C., Sparrow, P., & Howard, A. (2005). *The essentials of the new workplace: A guide to the human impact of modern working practices.* West Sussex: Wiley & Sons.
- Hyman, R. (1987). Strategy or structure? Capital, labour or control. *Work, Employment and Society*, 1(1), 25–55.
- Iszatt-White, M. (2007). Catching them at it: An ethnography of rule violation. *Ethnography*, 8(4), 445–465.
- Jagtman, E., & Hale, A. (2007). Safety learning and imagination versus safety bureaucracy in design of the traffic sector. *Safety Science*, 45(1&2), 231–251.
- Jones, D. C., Kalmi, P., & Kauhanen, A. (2010). Teams, incentive pay and productive efficiency: Evidence from a food-processing plant. *Industrial and Labor Relations Review*, 63(4), 606–626.

- Katzenbach, J. R., & Khan, Z. (2010). *Leading outside the line: How to mobilize the (in)formal organization, energize your team and get better results*. San Francisco, CA: Jossey-Bass.
- Marchington, M., Wilkinson, A., Ackers, P., & Goodman, J. (1994). Understanding the meaning of participation: Views from the workplace. *Human Relations*, 47(8), 867–894.
- McGovern, P., Hope-Hailey, V., & Stiles, P. (1998). The managerial career after downsizing: Case studies from the “Leading Edge”. *Work, Employment & Society*, 12(3), 457–477.
- Merton, R. K. (1949). *Social theory and social structure*. New York, NY: Free Press.
- Merton, R. K., Gray, A. P., Hockey, B., & Selvin, H. C. (Eds.). (1952). *Reader in bureaucracy*. Glencoe: Free Press.
- Mine Health and Safety Council (MHSC) (2011). *The culture transformation framework for the South African mining sector*. Johannesburg: Republic of South Africa.
- Mine Health and Safety Council (MHSC) (2014). *2014 occupational health and safety summit milestones*. Johannesburg: Republic of South Africa.
- Parker, M., & Slaughter, J. (1990). Management-by-stress: The team concept in the US auto industry. *Science as Culture*, 1(8), 27–58.
- Parker, M., & Slaughter, J. (1993). Should the labour movement buy TQM? *Journal of Organizational Change and Management*, 6(4), 43–56.
- Pelegrin, C. (2013). The never-ending story of proceduralization in aviation. In C. Bieder & M. Bourrier (Eds.), *Trapping safety into rules: How desirable or avoidable is proceduralization?* Surrey: Ashgate.
- Procter, S., & Mueller, F. (Eds.). (2000). *Teamworking: Management, work and organizations*. London: Macmillan.
- Reason, J. (1998). Achieving a safety culture: Theory and practice. *Work & Stress*, 12(3), 293–306.
- Reason, J. (2008). *The human contribution: Unsafe acts, accidents and heroic recoveries*. Surrey: Ashgate.
- Reason, J., Parker, D., & Lawton, R. (1998). Organizational controls and safety: The varieties of rule-related behaviour. *Journal of Occupational and Organizational Psychology*, 71(4), 289–304.
- Republic of South Africa (RSA) (1996). *Mine Health and Safety Act, Act 29 of 1996*. Pretoria: Government Printer.
- Richards, J. (2008). The many approaches to organisational misbehaviour: A review, map and research agenda. *Employee Relations*, 30(6), 653–678.
- Rinehart, J. (1984). Improving the quality of work through job redesign: Work humanization or work rationalization? *The Canadian Review of Sociology and Anthropology*, 23(4), 507–530.
- Roy, D. (1952). Quota restriction and goldbricking in a machine shop. *American Journal of Sociology*, 57(5), 427–444.
- Roy, D. (1953). Work satisfaction and social reward in quota achievement: An analysis of piecework incentive. *American Sociological Review*, 18(5), 507–514.
- Roy, D. (1954). Efficiency and the fix: Informal intergroup relations in a piecework machine shop. *American Journal of Sociology*, 60, 255–266.
- Smith, V. (1996). Employee involvement, involved employees: Participative work arrangements in a white-collar service occupation. *Social Problems*, 43(2), 166–179.
- Smith, V. (1997). New forms of work organization. *Annual Review of Sociology*, 23(1), 315–339.
- Vallas, S. P. (1999). Rethinking post-fordism: The meaning of workplace flexibility. *Sociological Theory*, 17(1), 68–101.
- Vallas, S. P. (2003a). The adventures of managerial hegemony: Teamwork, ideology and worker resistance. *Social Problems*, 50(2), 204–225.
- Vallas, S. P. (2003b). Why teamwork fails: Obstacles to workplace change in four manufacturing plants. *Sociological Review*, 68(2), 223–250.
- Vallas, S. P. (2006). Empowerment redux: Structure, agency and the remaking of managerial authority. *American Journal of Sociology*, 111(6), 1677–1717.
- Vallas, S. P., & Beck, J. P. (1996). The transformation of work revisited: The limits of flexibility in American manufacturing. *Social Problems*, 43(3), 339–361.

- Walton, R. (1985). From control to commitment in the workplace. *Harvard Business Review*, 63(March), 76–84.
- Webster, E., Moodie, D., Stewart, P., & Psoulis, C. (1999). *The Impact of Ultra-Deep Mining on the Occupational Culture of Miners*. Sociology of Work Programme (SWOP), University of the Witwatersrand, Johannesburg.
- Whittaker, S., & Marchington, M. (2003). Devolving HR responsibility to the line: Threat, opportunity or partnership? *Employee Relations*, 25(3), 245–261.