HANDBOOK
ON
OCCUPATIONAL HEALTH PRACTICE
IN THE
SOUTH AFRICAN MINING INDUSTRY

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EXECUTIVE SUMMARY

The “Handbook on Occupational Health Practice in the South African Mining Industry” provides managers, union officials, engineers, health and safety practitioners, occupational hygienists and occupational medical and nursing practitioners with practical tools to prevent occupational illness and disability.

Information on the identification, assessment and control of hazards and related diseases in the mining industry was to be integrated into a single authoritative manual that contained *best practice guidelines*. This was to serve as a practical guide, an audit tool, a planning tool, a referral document to other information sources, a vehicle for technology transfer and an education tool.

The project delivered 15 000 copies of the book within budget at a cost of R90 per book.

This document describes the process, outcome and some of the project management tools utilised in the process.
OBJECTIVE

Research and other information regarding occupational hazards and health effects in the mining industry are of varying quality and are available from a variety of sources. Thus this project was to assemble a knowledge base that would provide practical tools to prevent occupational illness and disability.

Information on the identification, assessment and control of hazards and related diseases in the mining industry was to be integrated into a single authoritative manual that contained best practice guidelines. This was to serve as a practical guide, an audit tool, a planning tool, a referral document to other information sources, a vehicle for technology transfer and an education tool.

The project was to be completed within 18 months on a budget of R1,48 million, made up from R1,08 million for authoring, editing and publishing costs (SIMHEALTH612) and R400,000 for printing and launch costs (SIMHEALTH713).

PROCESS

From the outset, the SIMHEALTH committee recognised that this project would be a complex one requiring many and varied authors, multiple reviewers, concise editing and frequent interaction with publishers and printers. A quality product delivered on time and within budget, would therefore require robust project management and an editing team was contracted on the basis of their wide-ranging knowledge of the topic and the industry, disparate but complementary skills, and an ability to operate as a team.

The editorial team initially explored the desired outputs and nine major process steps:

<table>
<thead>
<tr>
<th>STEP NO.</th>
<th>OUTPUT</th>
<th>MILESTONE DATE (MM/YYYY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Definition of product and target audience</td>
<td>03/2000</td>
</tr>
<tr>
<td>2</td>
<td>Specification of contents and format for chapter preparation</td>
<td>03/2000</td>
</tr>
<tr>
<td>3</td>
<td>Identification and briefing of expert writers</td>
<td>06/2000</td>
</tr>
<tr>
<td>4</td>
<td>Supervision and coordination of chapter preparation</td>
<td>12/2000</td>
</tr>
<tr>
<td>5</td>
<td>Writing of individual chapters</td>
<td>12/2000</td>
</tr>
<tr>
<td>6</td>
<td>Writing of introductory chapter/preface</td>
<td>12/2000</td>
</tr>
<tr>
<td>7</td>
<td>Collation of final manuscript</td>
<td>03/2001</td>
</tr>
<tr>
<td>8</td>
<td>Publishing of handbook</td>
<td>05/2001</td>
</tr>
<tr>
<td>9</td>
<td>Launch</td>
<td>06/2001</td>
</tr>
</tbody>
</table>

The timelines and project budget were closely monitored (appendix 1)

1. Definition of product & target audience

The target audience was identified as those persons who could provide the biggest impact in preventing occupational disease and disability. This was deemed to be mine and plant managers, union officials, occupational hygienists and occupational medical and nursing practitioners.
A proposed content framework was compiled and focus group consultations were undertaken with a sample from the employer, employee and State categories, so as to elaborate the real needs and requirements.

The suggestions were extremely wide but the common ground appeared to be:

- Legislation - recent changes and what they meant in practice, legislation not specific to health, safety and environmental (HSE) practice but which impinges on HSE practices
- Management systems, including corporate governance
- Auditing of management performance
- Performance indicators, specifically leading indicators that could be utilised to prevent disease and disability as opposed to tracking outcomes. Also seen as useful in reviewing the success of management interventions
- Hazard identification and risk assessment – seen as the basis for control and prevention of disease and disability
- Fitness to work, disability and compensation – a single, easily accessible reference document was not currently available
- Airborne pollutants, dust disease and Pulmonary Tuberculosis
- Noise management and possibly vibration
- Heat stress, with increasing attention to the open pit environment
- Chemical hazards – seen as an area that required greater attention
- Ergonomics – seen as an increasingly important topic for solutions to health and safety issues
- Ionising radiation
- Diving
- Occupational skin disorders

From a budgetary viewpoint, the editors decided that not all topics could be dealt with exhaustively but that a useful compromise would be to create a mix of general chapters that provided breadth of material and also some chapters specific to common hazards. General chapters would provide sufficient referral to sources of material should readers require depth whilst specific hazard chapters would consist of two sections.

The main section would provide a brief description of the degree of exposure and extent of health problems, a reference to the appropriate legal framework and an overview of best practice or accepted processes regarding:

- Risk assessment
- Monitoring (hygiene and medical surveillance)
- Control
- Treatment (e.g. TB)
- Rehabilitation and accommodation
- Assessment of fitness, impairment and disability
- Compensation

The appendices would contain material that was too technical or detailed for the main section and would be directed at those readers with the appropriate technical background in that subject area.

- Glossary of terms and concepts
- Summary of legislation / regulations
- Guidelines, e.g. MOHAC, ethical code for occupational health practice.
- Algorithms and flow diagrams, e.g. referral for compensation benefits
- Detailed protocols e.g. surveillance, measurement
- Administration forms e.g. DME reports, annual financial report
IDENTIFICATION OF HAZARD / RISK AND DETERMINATION OF HEALTH EFFECTS
  e.g. exposure to noise and noise induced hearing loss

IMPLEMENTATION OF CONTROL MEASURES
  Eliminate the risk
  Minimise the risk
  Control the risk at source
  Provide PPE

MONITORING OF CONTROL PROGRAMMES
  e.g. hearing conservation programme and use of hearing protection devices.

WORKER EXPOSURE DETERMINATION (Dose / Response)

ENVIRONMENTAL ENGINEERING AND CONTROL
  e.g. determination of noise levels in the working environment.

BIOLOGICAL SAMPLING AND MONITORING

FITNESS FOR WORK
  IMPAIRMENT
  DISABILITY

REHABILITATION ACCOMMODATION

COMPENSATION

Useful administration forms
Cross references to SIMRAC projects
Comprehensive bibliography
Contact Details of Experts
List of Suppliers - engineering solutions
PPE

Figure 1 Chapter layout to enhance readability
Simultaneously the format of the manual had to be decided; a circular process based on size, quality and format.

The manual could be a loose-leaf format in which pages could be removed and replaced as updates were produced. This was rejected as it was felt that the update cycle should not be shorter than every 3rd year, which would tie in with the research cycle – provide editors with a year’s preparation timed to start in the second year of circulation of the manual.

The manual could be a hard cover or soft cover format. Although hard cover provided better protection to the contents, soft cover was more cost-effective and sufficient protection if the manual were updated every third year.

The size of the manual was originally designed to fit into a coat or overalls pocket. However, this was unsuitable as the diagrams were too small to adequately visualise them and the amount of material would have resulted in a book that was almost 8cms thick. Therefore, the size was enlarged; the resultant specifications were:

Size: 247 x 171 mm
Description: Budgetary constraints meant less than 480 pages (sections sewn in 32 pages each, equates to 15 sections). Thread sewn sections with limp cover drawn onto spine and hinge, and trimmed flush
Printing: Contents to be printed in 1 colour throughout, except pictures relating to skin disease. This was a budgetary constraint.
Covers to be printed in 4 process colours and gloss film laminated osol
Material: Contents – 80gsm white bond
Covers – 231 gsm textcote board

These product specifications could only finalised with the input of the publisher/printer of which several were investigated - Juta’s, Butterworths, Oxford University Press, Blackwell Scientific Publications, Capetown University Press, Wits University Press, and Creda Communications – and Creda Communications1 was selected as the most cost-effective solution and subsequently contracted.

2. Specification of chapter contents and writing format

Prior to engaging prospective authors, the editors created author guides on the handbook content and the manuscript format. The handbook content framework would provide the authors with an idea of the goals of the project, chapter headings and the breadth and depth of their topic. The manuscript format was an attempt to standardise language and grammar usage and is attached as Appendix 2.

3. Identification and briefing of expert writers

The editors originally specified skill requirements of potential chapter writers, individuals identified and curriculum vitae requested from those who indicated interest in the project. These individuals were discussed with the SIMHEALTH committee and 19 authors were initially identified. During the process, three authors had to be replaced and an extra author contracted.

Author briefings were achieved by circulating guidance documents, placing performance measures in the contracts and direct conversation on an individual basis.

4. Supervision and coordination of chapter preparation

Editorial supervision ranged from improving the material in the broadest sense, looking at aspects such as content, organisation, language level, style and length to checking the finest details of fact, grammar, spelling, punctuation, and consistency. The author, as subject specialist, however, was ultimately responsible for factual accuracy.

1 Creda Communications, 21 School Street, Johannesburg 2001. Tel: (011) 334-1950 Fax: (011) 334-1962/3
Editors therefore provided intermittent but ongoing guidance to authors on chapter content, managed gaps and overlaps between chapter content, and maintained project timelines.

After editing, manuscripts were returned to the authors for comment and discussion with the editors so that any misconceptions or corrections could be sorted out.

Monthly editorial meetings were held to ensure coordination between editors, to review project timelines and to manage quality of the chapter content. The SIMHEALTH committee received a monthly feedback report on the progress of the project, consisting of a short report highlighting editorial actions with attached appendices (Appendices 1 & 3).

5. Writing of individual chapters

Authors were expected to:

- provide detailed chapter outlines, based on the prepared framework, elaborating those aspects particularly important to the topic (e.g. sampling strategy in air quality, audiometry in hearing conservation)
- derive information from literature reviews, statutory guidelines, well accepted and validated practices, international guidelines, or, in the absence of accepted models, from the author’s expert opinion
- briefly identify gaps in knowledge and practice
- provide key performance indicators/information management (if available)
- provide sources of information that elaborated complex aspects of the topic
- deliver specified outputs within the required timelines

6. Writing of introductory chapter or preface

The editors composed the preface following completion of the majority of the chapters. It was designed to give readers a concept of the aims of the handbook and the breadth and depth of content that could be expected.

7. Collation of the final manuscript and publishing

The draft manuscripts were forwarded to reviewers for comment and any alterations were discussed with the authors and authors requested to submit a final manuscript. Editors checked the final product (appendix 4), developed glossaries, chapter summaries and the contents and index of the book.

These documents were fully discussed with the publisher and the layout of the handbook planned, the artwork dropped into the pages, the cover designed and the prototype forwarded for printing.

8. Launch of the product

The product launch was designed to provide the targeted readership with an overview of the handbook and act as an initial distribution channel to specific personnel within all levels of the mining industry.

OUTCOME

The eventual quality of the handbook largely depended on editorial guidance of the chapter content, the writing skills of the authors and the ability of the editors to integrate the content across chapters so as to provide a cohesive handbook followed by the printers handling of electronic copy.
1. Handbook Contents

The first three chapters of the handbook provide a framework for the management of occupational health in mining and related operations. Chapter 1 summarises the legal setting for the practice of occupational health in the mining industry. The emphasis is on the Mine Health and Safety Act, but the additional important subjects of ethical medical practice and HIV testing are addressed. Chapter 2 describes the elements of a management system needed to give effect to the legislation and to meet the needs of various stakeholders. Chapter 3 is a guide to the performance of risk assessment directed at disease control rather than traditional safety objectives.

The major mining related hazards of airborne pollutants and lung disease, noise and vibration and heat are accorded primary attention in chapters 4 through 8. Ionising radiation, a neglected and poorly understood hazard in mining as noted by the Leon Commission, is dealt with in chapter 10. Chapters 9, 11 and 13 cover subjects which have received little attention in mining in South Africa, namely chemical hazards (other than mineral dusts and underground gases), musculoskeletal disorders caused by ergonomic stresses and skin disorders. Although mining in South Africa is dominated by gold, platinum and coal, the diving hazards of offshore diamond mining are sufficiently important to warrant a chapter of their own (chapter 12).

Return to work following illness, disability and compensation are thorny industrial relations issues, and their management requires an understanding of the medical, policy and legal dimensions of the subject. A dual compensation system, one for lung disease and a separate one for all other occupational diseases (and injuries), and an historical lack of access by black ex-miners to the compensation system, complicates the situation in the South African mining industry. This subject is dealt with in chapter 14.

The primary prevention of occupational disease requires control of hazards at source. However, the particular difficulties of source reduction measures in mining make choice of appropriate personal protective equipment an important subject, covered in chapter 15.

See Appendix 5 for outlines of each chapter.

2. Handbook Costs

The total cost of producing the handbook was R89,72 per book, the breakdown shown in Table 1. In retrospect, the number of hours required for editing tasks were approximately 70% more than originally anticipated.

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>COSTS EX VAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Authors</td>
<td>580 000</td>
</tr>
<tr>
<td>Editing</td>
<td>400 000</td>
</tr>
<tr>
<td>Publishing</td>
<td>100 000</td>
</tr>
<tr>
<td>Printing</td>
<td>265 758</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1 345 758</strong></td>
</tr>
</tbody>
</table>

Table 1 Breakdown of Handbook Costs
3. **Handbook Timelines**

Despite intense project management, the handbook was delivered 6 months late largely due to the following:

- alterations to the initial scope of the project – addition of an extra chapter late in the process
- difficulties experienced in contracting suitable authors for some chapters
- non-delivery of content from specific authors, which required contract cancellations and subsequent transfer to alternate authors
- late delivery of content from specific authors
- difficulties experienced by some authors in providing content in the requested format, especially the portrayal of technical material at a level easily understandable for the target audience. Editors were often required to rewrite large portions of chapters in an attempt to obtain the required style
- slow turnaround time from reviewers
- changes within the management structure of the publisher/printer and subsequent movement of certain desktop publication functions to Capetown

**LEARNING POINTS/RECOMMENDATIONS**

Technology transfer requires material to be presented to the target audience in a format easily understandable to them. The wider the scope of material that is to be transferred, the more complex will be the project and the quality and successful delivery depend on the application of project management tools. The following points may prove useful to future projects of a similar nature:

1. **Appointment of an editorial team**

   A single editor can control the publication of narrow topics but where the scope of material is wide and multi-faceted, an editorial team containing a balance of skills is preferable. As in any team, the personalities must be compatible and excellent communication between team members mandatory.

   If possible, appoint a team who has had editorial or publishing experience as well as knowledge of the topic for publication.

2. **Appointment of authors**

   The transfer of technical material in a professional publication (e.g. journal) is different to transferring the same material to a target audience of laypersons. The required writing style is totally different and most experts had great difficulty in addressing this as they are used to writing for technical publications. In this instance, experts could possibly be provided with access to professional writers who could “ghost write” the factual content provided by experts or alternatively, the editorial team should include this capability and budgetary adjustments made accordingly.

3. **Supervision and coordination of chapter preparation**

   It was clear that many authors had either not read or understood the guideline documents circulated to them prior to contracts being finalised and few experts recognised the distinction between a handbook and a textbook. The handbook was designed to address the “how to” as opposed to “what”. Furthermore, although the handbook was focused on the SA mining industry, certain authors originally omitted any reference to the industry or the current industry position and provided material that was accessible in other
publications. Little effort had been made to highlight up-to-date sources of information, on-going research (local and international) or new developments etc.

Once authors are identified, it is probably useful to undertake an orientation session with all authors, at a central venue, and outline the aims and requirements of the project as opposed to only circulating documents. However, personal discussion between editors and authors only minimally altered writing style to a minimal degree. The differences between authors that wrote for lay publications and those that wrote for professional journals were noticeable.

4. Collation of final manuscript and publishing

Publishers specialise in particular material and particular target audiences and markets. A publisher that is highly regarded in one market may not necessarily address other material and markets. It is important to obtain the services of one that is operating within the technology area of interest. Alternatively the editorial team should also contain publishing skills of design, layout and page balancing. Allowance must be made for electronic conversions of text from one format to another as errors can occur in the final print version although the submitted electronic form is correct. Formulae and scientific characters require particular attention. Sufficient time should be allowed for authors to proof read the print version in addition to the editors.

Otherwise, as with any project, the appropriate management tools and management flexibility are required to address changes in scope and the vagaries of human behaviour.
# PROJECT TIMELINES & BUDGETARY MANAGEMENT

<table>
<thead>
<tr>
<th>Process</th>
<th>Original Timeline</th>
<th>Complete</th>
<th>Budget (ex VAT)</th>
<th>Payment to date (ex VAT)</th>
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<td>Identify potential readership</td>
<td>03/2000</td>
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<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Consult with potential readership re content</td>
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<td>✓</td>
<td>40 000</td>
<td></td>
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<tr>
<td>Investigate product format – soft/hard cover etc.</td>
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<td>40 000</td>
<td></td>
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<tr>
<td>Identify and subcontract publisher / printer</td>
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<td>48 000</td>
<td></td>
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<tr>
<td>Decide on chapter headings and content</td>
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<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Specify structure of handbook – length, style, chapter layout etc.</td>
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<td>✓</td>
<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Identify potential chapter writers</td>
<td></td>
<td>✓</td>
<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Obtain c.v.’s of potential authors</td>
<td></td>
<td>✓</td>
<td>64 000</td>
<td></td>
</tr>
<tr>
<td>Provide SIMHEALTH committee with proposals and finalise author list</td>
<td>06/2000</td>
<td>✓</td>
<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Formulate contributor guidelines and checklists to ensure that all relevant material is forwarded to editors</td>
<td>06/2000</td>
<td>✓</td>
<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Formulate subcontracts, desired outputs and payment schedule for authors</td>
<td></td>
<td>✓</td>
<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Contract authors</td>
<td></td>
<td>✓</td>
<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Editors clarify requirements and outputs with authors</td>
<td></td>
<td>✓</td>
<td>30 000</td>
<td>82 000</td>
</tr>
<tr>
<td>Obtain chapter outline from authors</td>
<td></td>
<td>✓</td>
<td>52 000</td>
<td></td>
</tr>
<tr>
<td>Editors identify &amp; discuss changes</td>
<td></td>
<td>✓</td>
<td>18 000</td>
<td>18 000</td>
</tr>
<tr>
<td>Obtain first draft from authors</td>
<td></td>
<td>✓</td>
<td>260 000</td>
<td>260 000</td>
</tr>
<tr>
<td>Edit first draft and return to authors</td>
<td>12/2000</td>
<td>✓</td>
<td>48 000</td>
<td>48 000</td>
</tr>
<tr>
<td>Authors to complete final draft</td>
<td>10/2001</td>
<td>✓</td>
<td>104 000</td>
<td>152 000</td>
</tr>
<tr>
<td>Edit final draft and return to authors for finalisation</td>
<td>11/2001</td>
<td>✓</td>
<td>48 000</td>
<td></td>
</tr>
<tr>
<td>Authors to return finished work</td>
<td>11/2001</td>
<td>✓</td>
<td>104 000</td>
<td>136 000</td>
</tr>
<tr>
<td>Editors to write introductory chapter / preface and index</td>
<td>10/2001</td>
<td>✓</td>
<td>32 000</td>
<td></td>
</tr>
<tr>
<td>Collate manuscript, proof-read and deliver to publisher</td>
<td>03/2001</td>
<td>10/2001</td>
<td>48 000</td>
<td>107 330</td>
</tr>
<tr>
<td>Produce prototype of handbook</td>
<td>05/2001</td>
<td>12/2001</td>
<td>59 330</td>
<td></td>
</tr>
<tr>
<td>Deliver to SIMHEALTH and make recommendations regarding future updates</td>
<td>06/2001</td>
<td>01/2002</td>
<td>52 670</td>
<td>Jan 2002</td>
</tr>
<tr>
<td>Addition of extra chapter - PPE</td>
<td>07/2001</td>
<td>09/2001</td>
<td>80 000</td>
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</tr>
</tbody>
</table>

**TOTALS**

|               |                  |          | 1 080 000 | 1 027 330   |

Approval sought 16/01/2001: Inv. No. 70/2002 - R 52 670
AUTHOR GUIDE ON MANUSCRIPT FORMAT

1. TYPING THE MANUSCRIPT

This guideline is designed to ensure a degree of uniformity amongst authors and provide an efficient means of providing a consistent manuscript to the publishers. The length of the book is critical to costs and it is essential that authors work within the given parameters. Careful planning of the text and illustrations, and equally careful writing are needed.

It is not necessary to make the manuscript look like the envisaged book in terms of layout (design). Many of the formatting commands used to format a word-processed document are counter-productive to the type setting process, and must be removed during editing. The manuscript may not look aesthetically appealing but it will save the editors an enormous amount of time by avoiding the use of formatting commands and style sheets.

2. WORKING ON COMPUTER

- Please save your files as MSWord 95/98 or text files
- Ensure that your hard drive and disks are virus free (Use new disks)
- Please supply your manuscript on IBM-compatible/formatted disks
- Leave at least 50 000 bytes free on a disk as over-full disks sometimes malfunction
- Remove any files from the disk that do not relate to the manuscript
- Place the illustrations on a disk separate from that containing the text
- Label your disks clearly before handing them over. Please write the date, on which you last saved the files, on your disks. Provide a full list of the names of the files on the disk, indicating what is in those files. Also include a latest set of hard copy/lasers
- Make regular back-ups of your work, and keep a back-up copy of the manuscript disk once you have delivered it to the editor

3. TYPING THE TEXT

- The text should be printed on A4 paper, and should have double line spacing, with roughly the same number of lines on each page
- Use only Times New Roman – 11 pt in the body of the text
- Text is to be typed flush left: do not insert indents or tabs within the text, it must simply run on (this does not apply to lists and tables: see below)
- Text should align on the left i.e. leave the right margin ragged. Please do not fully justify any text
- See below for table text
- A hard return (enter) must be used only after headings and at the end of a paragraph; never within paragraphs
- Do not insert hard page breaks
- Remove all hidden text before submitting your manuscript on disk. Examples of hidden text are comments in documents that are visible on screen but do not print out; tags attached to headings or text for creating contents on index pages; and footnotes or endnotes
- Use a spell checker before submitting the manuscript and ensure that the checker utilises South African English as opposed to American English
- Limit the inclusion of detailed mathematical, statistical or other scientific expositions within the body of the text
- Text should not include abbreviations that are not generally recognised

4. STYLE

Tables & columns

- Use your word processing table formatting
Punctuation

- Insert one space after all full stops; never insert two spaces
- Leave no spaces before punctuation marks (e.g. before a colon)
- Use double quotation marks for quoted material or direct speech (do not use special characters to create these; use the keyboard). Use single quotation marks for interior quotations
- The relative position of a closing quotation mark and punctuation may be summarised as follows:
  - If a punctuation mark is part of the quotation, it should be placed inside the quotation mark; e.g. He shouted the warning just as she was about to cross the street, “A bus!”
  - If the punctuation mark relates to the sentence rather than to the quotation, it should be placed outside the quotation mark; e.g. How many people can say, “I saved a life today”? 
  - If the whole of a printed sentence is a quotation, the punctuation mark should be placed inside the closing quotation mark; e.g. “To be or not to be, that is the question.”
  - If only part of the printed sentence is quoted, the punctuation should be outside the closing quotation mark; e.g. “Faith is the substance of things hoped for”.
- Do not hyphenate words at the end of lines, and make sure that your word processing package will not hyphenate automatically.
- For ellipsis type: space, three full stops, space. e.g. All I need to know about life … I learned from my cat.
- In a series of three or more terms with a single conjunction, use a comma after each term except the last. e.g. You can eat cheese, eggs, or fish.

Signs & symbols

- For a dash simply type; space, hyphen, space
- When typing numbers, type 10 000 and not 10,000
- Do not use:
  - the letter O (oh) when you mean the numeral 0 (zero)
  - the letter l (el) when you mean the numeral 1 (one)
- Special characters, like ° in 90° should be marked by hand on the hard copy.
- Do not format superscripts or subscripts. Mark these by hand on the manuscript.
- When typing units of measure, e.g. 15 km, type 15 space km BUT 15% (no space)
- Avoid excessive use of initial capitals, e.g. use mathematics rather than Mathematics.
- Acronym-style abbreviations, like HSE, should be typed in capitals with no full stops.
- Do not use capitals for emphasis

Headings

- Only the first letter of a heading should be a capital letter; the rest of the heading should be in small letters, except for proper nouns.
- Use Times New Roman Bold 14 point for main headings and Times New Roman Bold 12 point for sub-headings
- Where headings are numbered, simply type in the number, then one space, then the heading. e.g. 1 The heart
- Please differentiate between heading levels, either by formatting them or marking the hard copy by hand. Please do not use your word processing style command for the headings
- Avoid using too many levels of sub-headings. Usually a main heading and a sub-heading will be adequate

Numbering and asterisks

- Please do not use automatic numbering or bullets for lists
• When numbering parts of text (such as questions) or type texts in lists, please insert one tab between 1, a), etc., and the text that follows. e.g.:
  1[tab]All I need to know about life I learned from my cat
  [tab][tab]life is hard, then you nap
  [tab][tab]when in doubt, cop an attitude
• Use only asterisks * for lists, and do not insert special character bullets or use bullet formatting as these will be inserted by the type-setter

**Numbers – words or figures**

• Avoid beginning a sentence with a numeral.
• It is usual to spell out numerals only up to ninety-nine in continuous text. However, when there are many figures, it is better to spell out only up to nine. Round numbers above twenty may be written in words when they are not part of a series, for instance, a million squatters. Consistency is important
• Round off numbers and decimals whenever possible
• Use the comma and not the stop to indicate decimal fractions. Use 0,5 as opposed to ,5 when writing decimal fractions

**Spacing**

• Note that the initials of personal names should not be spaced: (A.W. Bloggs) e.g.: A.W. Bloggs and not A.W.Bloggs or A. W. Bloggs
• There is a space after p. and pp. in page references.

**Italics**

• Foreign words and short phrases, which have not been naturalised, are put in italic. Most of the common abbreviations are kept in roman type (et al., ibid., i.e., op. cit., q.v., vice versa, viz.) but circa, passim, sic are italic
• Use italics for published books and journals
• Please do not use italics or bold to emphasise words. Mark up important words by hand and the editors and designer will decide how to create emphasis.

**Percentages**

Normally per cent (two words) should be spelt out in the text unless it is used frequently. Use % in tables and footnotes.

**The apostrophe**

Note that there is no apostrophe in plural forms such as MPs, 1960s etc.

**Dates**

• Use the form 25 July 1999, without commas.
• Abbreviate weekdays and all months except May, June, and July in footnotes and tables
• Spell out twentieth century except in footnotes or tables

**Time**

Use international time notations. i.e. 08:15 and not 08h15

5. DOCUMENTING SOURCES

Wherever a statement is made that is not the author’s own, the source of the statement must be cited. The author and year of publication are cited in the text and the full documentation is given in a reference list (alphabetised by author surname) at the end of each chapter.
Form of citation

- The author’s surname, date of publication, and page reference (where necessary) are given in parentheses. Note that there is no punctuation after the author’s name. A comma precedes the page number.
  e.g. The union published a note of protest over the action (Geldenhuys 1992, 79)
- If the author’s name forms part of the sentence, it is not repeated in parentheses
  e.g. Ramphele and Wilson (1990) argue that ….
- If the author has published two or more works in the same year, these are labelled 1995a, 1995b, etc. If more than one of these works is included in the same text citation, put 1995a, 1995b. The author’s surname, date of publication, and page reference (where necessary) are given in parentheses. Note that there is no punctuation after the author’s name. A comma precedes the page number.
  e.g. (Prinsloo 1995a)
    (Prinsloo 1995a, 1995b)
- Several works cited by the same author are cited as follows
  e.g. (Mpati 1983a, 1989b, 1990)
  (Mpati 1983a, 10; 1989b, 1990, 3)
- Use and, not &, between the names of joint authors in parentheses and also running text.
  e.g. (Nkomo, Brown and Smith 1990)
  Swilling and Plas (1994) defined it as ….
- Use et al. consistently for in-text citations of works by more than three authors. If there are two groups of authors that can be abbreviated to say, Thembela et al., distinguish citations by including a short title of the work cited.
  e.g. Thembela, Norman, Hazel, and Letuma 1992 would be:
  Thembela, Smith, Herschel, and Louw 1994 would be:
- When several references are cited together in the text, it is suggested that they are placed in chronological order. The references are separated by semicolons.
  e.g. (Light 1982; Light and Wong 1985; Kingston 1988)
  When a reference is to both volume and page of the author’s work, it is styled
  (Booth 1991, 3:29)
- Reference to a volume only
  (Booth 1991, vol. 3)
- A name of a group or organisation may serve as an author’s name
  e.g. (Bureau for Information 1988)
- Include the author’s initials in the text citation where there are sources by two authors with the same surname
  e.g. (W.A. Bloggs 1991)
  (C.D. Bloggs 1993)

Reference Lists

- Alphabetise the list of references by author’s surname and provide initials consistently. Works by a single author are listed chronologically before those he or she wrote in collaboration with others. Joint works are arranged alphabetically by second author. The 3-em dash (——–) replaces the name of the author for successive works by the same person.
  Jones, A. G. 1995
    ——— 1996.
For two or more works by the same author published in the same year, alphabetise the entries by title. Add the letter a, b, and so on immediately after the date:
Ramphele, R. A. 1970a, Charting the Atlantic.
——— 1970b, Navigational systems.

- References to books should include the following information:
  Name of the author(s), or institution
  Date of publication
  Book title
  Editor/compiler or translator (if applicable)
  Publisher

Note that book titles are in normal font. Use capital letters only for the first word of the title, first word of a subtitle, and all proper nouns and adjectives

- References to journal articles should include the following information:
  Name of the authors
  Date of publication
  Title of article
  Name of periodical
  Volume/issue number (where given)
  Pages occupied by article

- References to unpublished material, dissertation or thesis

- Reference to a report

- Reference to the proceedings of a conference, symposium or colloquium:

- Reference to an official publication:

- Reference to a standard:
OHSAS 18002: 1999 Occupational health and safety management systems: Guidelines for the implementation of OHSAS 18001. London: British Standards Institute

- Referencing figures
Figure 2.4 The relationship between dust induced lung dysfunction and exposure times. (After [or modified from] Cook, 1995)

- Referencing internet sites
Health and Safety Executive (HSE) - UK
http://www.open.gov.uk/hse/

National Institute for Occupational Safety and Health (NIOSH) - USA
http://www.msha.gov/

International Organisation for Standardisation (ISO) - Switzerland
http://www.iso.ch/
Atlas Copco
http://www.atlascopco.se/
Atlas Copco is an international group of companies that manufactures compressors, construction and mining equipment as well as power tools

Boart Longyear
http://www.boartlongyear.com/
Boart provides a wide range of mining equipment including diamond-drilling products, percussion drilling tools and equipment, hard materials, materials handling and minerals processing equipment. The Boart Longyear Research Centre based in South Africa focuses on the innovative development of hard metal tools and wear parts.

6. ENDNOTES
Endnotes are preferred to footnotes.
Type endnotes at the end of each chapter and then cross-reference them in the text by writing in superscript numbers by hand. Please do not use footnote or end note functions on the computer as this causes problems for the editor and designer. Keep notes as brief as possible and abbreviate more freely than you would in the body of the text.

7. TABLE OF CONTENTS
Please include a contents page that indicates the exact headings and sub-headings used in the chapter and link them to the pages on which they may be found.

8. PREPARING THE ART WORK
• Use graphics instead of amorphous sections of text but only include illustrations that make a definite contribution. Draw up your art brief while you are writing and ensure that it is clear and complete. The brief should be submitted at the same time as the manuscript
• Specify exactly what you would like to have illustrated and the source of the material. Indicate whether it is a photograph, line art, or a colour illustration. Also give an indication of the size of each illustration – quarter page, half page, or full page. Scan the illustration, convert it to a Microsoft Word picture or PowerPoint object and copy it to floppy disk
• Should you create your own graphic, it is preferred that it is in PowerPoint
• Present trends and data in graphs rather than tables or within text blocks
• Please submit captions as a separate file on disk, or if you are supplying references for the art, write the caption under the reference
• Please discuss the art brief with the editor

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10. DELIVERING THE MANUSCRIPT
Checking the manuscript before delivery
The manuscript should be proofread before it is sent to the editors. This applies particularly to quotations, bibliographic details in source notes and bibliography (which must match), numerical data, proper names, consistency of spelling and capitalisation,
correct grading of headings, and numbering of tables and figures. Also check that the wording in tables of contents matches the wording actually used in the main text.
The final draft should be sent to the editors in its final definitive stage. If one or two items have to follow later, this should be specified in a covering note.

Covering note

If there are special difficulties or conventions, the author should inform the editors of these at an early stage. The editors can provide comments on sample chapters as well as more general advice on the preparation of the manuscript. Sorting out problems at an early stage helps to save time later on.
A covering note with the manuscript explaining any particulars or special conventions will greatly assist the editors. Also specify any deviation from the conventions set out in this document.

Numbering the pages

Please number all the pages in the printout of the manuscript, including prelims and end matter. Pages added after the manuscript has been presented should be inserted in the correct places, cross referenced on the preceding page and numbered 16a, 16b etc., in the case of additional text to follow page 16. If a complete page is removed, indicate this with a double number on the preceding page (e.g. if p. 8 is deleted then p. 7 should be numbered 7/8).

Making the manuscript easy to photocopy

There should be no additions attached by paper clips, staples, or sellotape; it is impossible for the editor to write on the latter. Additional text may be passed in, but please ensure that all pages are of uniform size. There should be no flaps to lift up or bits of paper sticking off the edge of a page.
Use only A4 paper.
Work on one side of the paper only.
Stick pictures down carefully, especially at the corners and edges.
If you correct errors on the manuscript, please use black ink to ensure good photocopy quality.
Print on high quality (not draft) text to improve the contrast between the paper and the ink in your original.
The editors should be given finished copy, there should be no more than an average of two hand written corrections per page. Please ensure that all corrections are captured on disk before submitting the manuscript and disk.

11. EDITORIAL AND PRODUCTION PROCEDURES

The role of the editor is two-fold: to carry out an edit of the manuscript and to oversee the production of the book, including collation of the chapters, according to the production schedule.
In editing the manuscript, the editors' tasks range from improving the material in the broadest sense, looking at aspects such as content, organisation, language level, style and length to checking the finest details of fact, grammar, spelling, punctuation, and consistency. The author, as subject specialist, however, is ultimately responsible for factual accuracy.
The editing has been broken into four stages:
• Perusal of an appropriate title for the chapter and a detailed framework for the contents to be included in the chapter - 26 May 2000
• Perusal of first draft of the chapter - 21 July 2000
• Perusal of final draft - 29 September 2000
• Final product - 27 October 2000
After editing, the manuscript will be returned to the author for comment and discussion with the editor so that any misconceptions or corrections can be sorted out. After all corrections have been made to the final draft and carried out on the computer files, the editor briefs the designer, who plans the design of the book and marks up a clean copy of the edited manuscript for the typesetter. The typesetter typesets the text, and provides galleys that will be checked by the editors and designer. Usually the typesetter provides a second set of corrected galleys. The paste-up then starts in which the designer decides on the layout of each page and leaves appropriate spaces for artwork. This can be done on the physical galleys or on the computer. This results in page proofs that are checked by the editor and designer and corrections are carried out. Once this is completed, the artwork is dropped into the page proofs. This shows exactly what the pages of the book will look like, and the editor must give final approval to this paste-up. The paste-up and original artwork are then sent for reproduction and the book printed. Please note that authors should make all major changes to the text when they receive the edited version of the final draft. Once the book has been set, only minor text changes, such as spelling errors, will be made as corrections can be very costly once the book has been set. During this process, the book’s cover will be designed, the index completed and a promotion plan elaborated. Comments and suggestions from authors on the promotion of the book will be welcomed.
## MANAGING CHAPTER QUALITY & REVIEWER TIMELINES

<table>
<thead>
<tr>
<th>Chapter/Author</th>
<th>Reviewer</th>
<th>Sent Date</th>
<th>Quality</th>
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<tbody>
<tr>
<td>Ch 1 Legislation</td>
<td>Paul Benjamin</td>
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<td>Guideline not followed. Content poor. Must be rewritten</td>
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<td>Ch 2 Management</td>
<td>Haggis Guild</td>
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<td>Ch 3 Risk assessment</td>
<td>Marais/Guild</td>
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<td>Guideline partially fulfilled but content poor. Requires major surgery</td>
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<td>Ch 4 Airborne pollutants</td>
<td>Dave Unsted</td>
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<td>Guideline not completely fulfilled but content good. Requires some effort</td>
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<td>Ch 5 Lung disease</td>
<td>Neil White</td>
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<td>Ch 6 TB</td>
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<td>Ch 10 Radiation</td>
<td>Dennis Wymer</td>
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<td>Ch 11 Ergonomics</td>
<td>Jan v Tonder</td>
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<td>Ch 12 Marine mining</td>
<td>Allan Kayle</td>
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<td>Ch 13 Skin Disease</td>
<td>Todd/Carman</td>
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<td>Ch 15 PPE</td>
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*Guidelines not followed.* Content poor. Must be rewritten.

*Guideline partially fulfilled but content poor. Requires major surgery.*

*Guideline not completely fulfilled but content good. Requires some effort.*

*Guideline fulfilled. Content good. Requires minor “tweaking”.*
## CHECKLIST FOR SUBMITTING FINAL MANUSCRIPT

<table>
<thead>
<tr>
<th>Item</th>
<th>Variance</th>
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<tbody>
<tr>
<td>1 Is within word limit.</td>
<td>Less than 10% over limit</td>
</tr>
<tr>
<td>2 Has been spell and grammar checked.</td>
<td>Nil</td>
</tr>
<tr>
<td>3 Conforms to Manuscript Format (“style”) guideline (font, spacing, subheadings, reference format, tables, figures, etc.) All abbreviations, acronyms spelled in full on first usage.</td>
<td>Nil</td>
</tr>
<tr>
<td>4 Conforms to Handbook Structure (“main headings and content”) guideline.</td>
<td>Not all chapters will have all headings, and their relative weight will vary. E.g., all hazard chapters start with Extent of problem in SA mining industry, followed by Legal framework.</td>
</tr>
<tr>
<td>5 Refers to law, standards, policy, guidelines, procedures, etc. specific to the South African mining industry, and covers all the main commodities (i.e. not just gold).</td>
<td>Standards, examples from elsewhere only where relevant or are being specifically recommended.</td>
</tr>
<tr>
<td>6 Takes into account that the chapter will be read by working managers, union officials, hygiene and safety personnel, DME inspectors, doctors and nurses. (Is not primarily meant for students, fellow experts or researchers).</td>
<td>May have primary target readership, but allows for others. Thus, e.g., the more technical details are placed in appendix.</td>
</tr>
<tr>
<td>7 Emphasises “how to do” and “where to find”. Recommends best practice or directs reader to sources. After reading, the chapter, or relevant section, the reader will know what to do to reduce the risk of occupational disease, etc. among miners (Is not a set of introductory notes to the discipline, a research review or a discursive critique).</td>
<td>In some areas, procedures have yet to be developed or legislated. In such cases, author gives expert recommendation on best practice or uses template from elsewhere. Anticipates any legislation in the pipeline.</td>
</tr>
<tr>
<td>8 Under Guides to Resources, includes useful websites, reports (including all relevant SIMRAC or other South African studies) and only those articles that it would be useful for the reader to acquire and read. Limited to approximately 30 items.</td>
<td>Could include landmark articles but remembering that the handbook is not directed at researchers.</td>
</tr>
<tr>
<td>9 Includes, author’s title, qualification, and affiliation, and also a Contents, Tables and Figures list for the front of the book.</td>
<td>Nil</td>
</tr>
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</table>
CHAPTER OUTLINES

CHAPTER 1  The legal, policy and ethical framework of occupational health practice in the South African mining industry

This chapter sets out the legal, policy and ethical framework within which the practice of occupational health occurs in the South African mining industry.

The Mine Health and Safety Act 29 of 1996 (MHSA) is the principal law regulating occupational health practice in South Africa’s mining industry. This chapter summarises the policy considerations that led to the enactment of the Act and discusses those provisions that are relevant to the conduct of occupational health practice. The chapter also covers the ethical considerations relevant to occupational health practice.

A number of other statutes regulate the practice of occupational health, particularly the management of disability. These statutes include the Labour Relations Act 66 of 1995 (LRA), the Basic Conditions of Employment Act 75 of 1997 (BCEA) and the Employment Equity Act (EEA). The BCEA and EEA both regulate the employment of disabled persons. The EEA also has far reaching provisions dealing with medical testing of employees and the provisions dealing with HIV testing, which have attracted considerable attention, are discussed in some detail. The BCEA also imposes obligations in respect of night workers and pregnant workers.

CHAPTER 2  Occupational Health Management

Occupational health management systems make an important contribution to the protection of workers from hazards and the elimination of work-related injuries, illness, disease, incidents and death. This chapter is intended to give some background to the establishment and operation of occupational health management systems. It addresses management in terms of goals, structures and processes, effective decision-making and monitoring. Legislation and other factors external to the work environment have greatly influenced occupational health management of activities from hazard exposure to disability assessment. This chapter provides an overview of corporate governance, indicates the key elements that should be incorporated in an occupational health management system and expands on two important areas, namely information management and reporting and auditing. The chapter should assist the reader to implement a comprehensive management system framework and the appendices contain useful tools and relevant definitions for occupational health management, regardless of the size of the organisation.

CHAPTER 3  Hazard Identification and Risk Assessment

The aim of this section is to provide a structured and systematic approach to the identification of hazards, evaluation of risks and prioritisation of decisions required to reduce potential risks to a tolerable level.

It is important to understand that there is no such thing as an exact assessment that can be evaluated against exposure standards. Published exposure standards should not be regarded as fine dividing lines between safe and dangerous concentrations of hazards that can then be compared against measured workplace conditions. Professional judgement is required and thus an understanding of the factors that affect assessment and experience of the work processes contribute greatly to good decision-making.

CHAPTER 4  Airborne Pollutants

This chapter describes and classifies the various airborne pollutants. The hazards posed by these pollutants and their occurrence and origins are discussed together with sampling and monitoring techniques and strategies. The legal limits of exposure to airborne pollutants are set out and control methods applicable to these pollutants are described.
CHAPTER 5 Occupational Lung Disease

This chapter will assist readers to understand and manage occupational lung disease risks in the South African mining industry. The most important diseases are described, with an emphasis on clinical features and on the association between exposure and occurrence of disease. Where possible this is based on research conducted in South Africa. The relevant legal framework in terms of the Mine Health and Safety Act (MHSA) and the Occupational Diseases in Mines and Works Act (ODMWA) is reviewed. Medical surveillance is discussed in detail. The use of questionnaires, chest x-rays, spirometry and other investigations in screening for occupational disease is detailed, as well as how to manage the resulting information.

CHAPTER 6 Tuberculosis and Associated Diseases

This chapter outlines the risk factors, natural history and methods for control and treatment of tuberculosis (TB), a disease caused by infection with *mycobacterium tuberculosis*. The close association of Human Immunodeficiency Virus (HIV) and TB is emphasised. The chapter provides detailed best practice guidelines for diagnosing and treating TB in the South African mining industry and designing a comprehensive TB control programme.

The chapter also covers the management of disease due to nontuberculous mycobacteria. This disease is related to TB and currently makes up 10 percent of mycobacterial disease among miners. These are the first published South African guidelines for the management of NTM disease.

CHAPTER 7 Noise and Vibration

This chapter covers best practice regarding the hazards of noise and vibration. It is intended as a practical guide and reference document, as well as a tool for audits/assessments and prioritising sources of risk for appropriate interventions. The chapter also serves as an informational and educational tool for persons unfamiliar with these two important health hazards. References to sources of additional information and the appendices facilitate access to more specific details.

CHAPTER 8 Heat

The assessment and subsequent management of heat stress, particularly in a South African mining context, is complex. Heat stress is the net effect on the human body of the combined contributions of metabolic heat production during physical work and environmental heat loads. Factors such as inherent traits, general health and physiological status have a profound influence on the ultimate level of heat stress. In this respect, heat stress is unique and the integrity of the risk assessment-risk management process is heavily dependent on the extent to which occupational hygiene and occupational medicine are integrated.

The purpose of the chapter is to emphasise this elementary requirement and highlight the rationale and the principles underlying the risk assessment and risk management process, as well as drawing attention to some of the more common pitfalls. Figure 8.1 provides a framework against which risk assessment and risk management should be conducted, implemented and controlled. It should be noted that the process described takes into account the essential requirements specified in the Mine Health and Safety Act and the relevant Department of Minerals and Energy’s guideline for the compilation of a mandatory code of practice or, more specifically, an occupational health programme.

CHAPTER 9 Chemical Hazards

This chapter discusses chemical hazards in the mining industry and the adverse health effects associated with the common chemicals encountered. A detailed guide to medical surveillance and biological monitoring is provided. The chapter includes a generic classification of chemical hazards, assessment and monitoring of exposures and control strategies.
The chapter has been prepared from resources on the Internet and extensive Internet links are provided for further information. The links have also been incorporated into the ASOSH (Association of Societies for Occupational Safety and Health) web site (asosh.org) where they will be updated from time to time.

CHAPTER 10 Ionising Radiation

This Chapter describes the nature and extent of exposures to natural sources of radiation in the mining industry, the health effects of radiation, international principles of radiation protection, and the legal framework within which exposures are controlled in the South African mining industry. Best practice radiation protection guidelines are provided, including monitoring of exposures, health surveillance, and engineering and administrative controls. Further technical and regulatory information is appended, together with a comprehensive list of international references providing more detailed guidance pertinent to the identification, assessment and control of radiation hazards in mines.

CHAPTER 11 Ergonomics

Ergonomics is mentioned specifically in the Mine Health and Safety Act but, generally speaking, the nature and scope of the subject are not well understood. This chapter gives an overview of ergonomics, why it is important to recognize ergonomics related hazards during risk assessment and the importance of correctly designed equipment and workplaces. Shiftwork is addressed briefly as is computer work environments. Guidance is provided on how to set up an ergonomics programme and a checklist will assist the interested reader to identify potential problem areas.

CHAPTER 12 Diving

It is not widely appreciated that diving is a primary hazard in the offshore diamond mining industry. This chapter identifies diving hazards and details their physiological and pathological effects. The prevention of diving-related problems and their management and treatment are addressed succinctly. A list of references is provided to assist the interested reader in identifying sources of further information.

CHAPTER 13 Occupational Skin Disorders

This chapter covers the important topic of occupational skin disorders that have been largely unrecognised and underreported, much less researched, in the mining industry. The introduction summarises local and international information on skin diseases in the mining industry and research needs are discussed. The relevant legal framework and compensation issues are briefly outlined. The clinical approach to skin diseases summarises the conditions most likely to be encountered in the industry.

Risk assessment of skin hazards addresses the complexities of assessing skin exposure risk and the deficiencies of applying recognised exposure levels to occupational skin diseases. The skin barrier function in identifying hazards is highlighted. Personal protective equipment is discussed with particular emphasis on skin protection. General principals relevant to all PPE are addressed with additional sections on gloves and barrier creams. Rehabilitation and accommodation of mineworkers with impairment and disability due to skin disease gives the reader a general guide to occupational skin diseases with emphasis on those that need special consideration.

CHAPTER 14 Fitness to Work, Disability and Compensation

This chapter covers an approach to assessing fitness for work and assessing and managing work disability in employees. The concepts of minimum standards, unfitness for work, impairment and disability are defined. A structured, staged approach to fitness certification is presented as well as a stepwise approach to handling the unfit employee.

The two statutory compensation systems applicable to miners are described, one for occupational lung diseases under the Occupational Diseases in Mines and Works Act and
one for all other diseases and injuries under the Compensation for Occupational Injuries and Diseases Act. Procedures are detailed for conducting medical benefit examinations under the former Act as well as for submitting occupational disease claims under both Acts.

CHAPTER 15 Personal Protective Equipment

There is a bewildering array of personal protective equipment. The basic principles of equipment selection are provided in this introductory overview. They include identifying hazards, measuring their concentration, understanding the use and limitations of specific devices, ensuring adequate personal fit, undertaking the necessary maintenance and making sure that employees are adequately trained in the use of equipment under both normal and emergency conditions.