A HANDBOOK ON

OCCUPATIONAL HEALTH PRACTICE IN THE SOUTH AFRICAN MINING INDUSTRY

CHAPTER 18

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Chapter 18

Women in Mining

The aim of this chapter is to transfer knowledge to the South African mining industry about female miners in the South African context. In the past, the South African mining industry was dominated by men; however, with the new gender-specific legislation, women are now encouraged to play meaningful roles in the mining sector. Previously, women occupied administrative or lower-rank positions in the mines, as they were deemed to be physically unable to complete the hard labour that was required. Recently, the employment of women has increased, exceeding the 10–13% female employment quota that was stipulated by the Mining Charter in 2002 (1).

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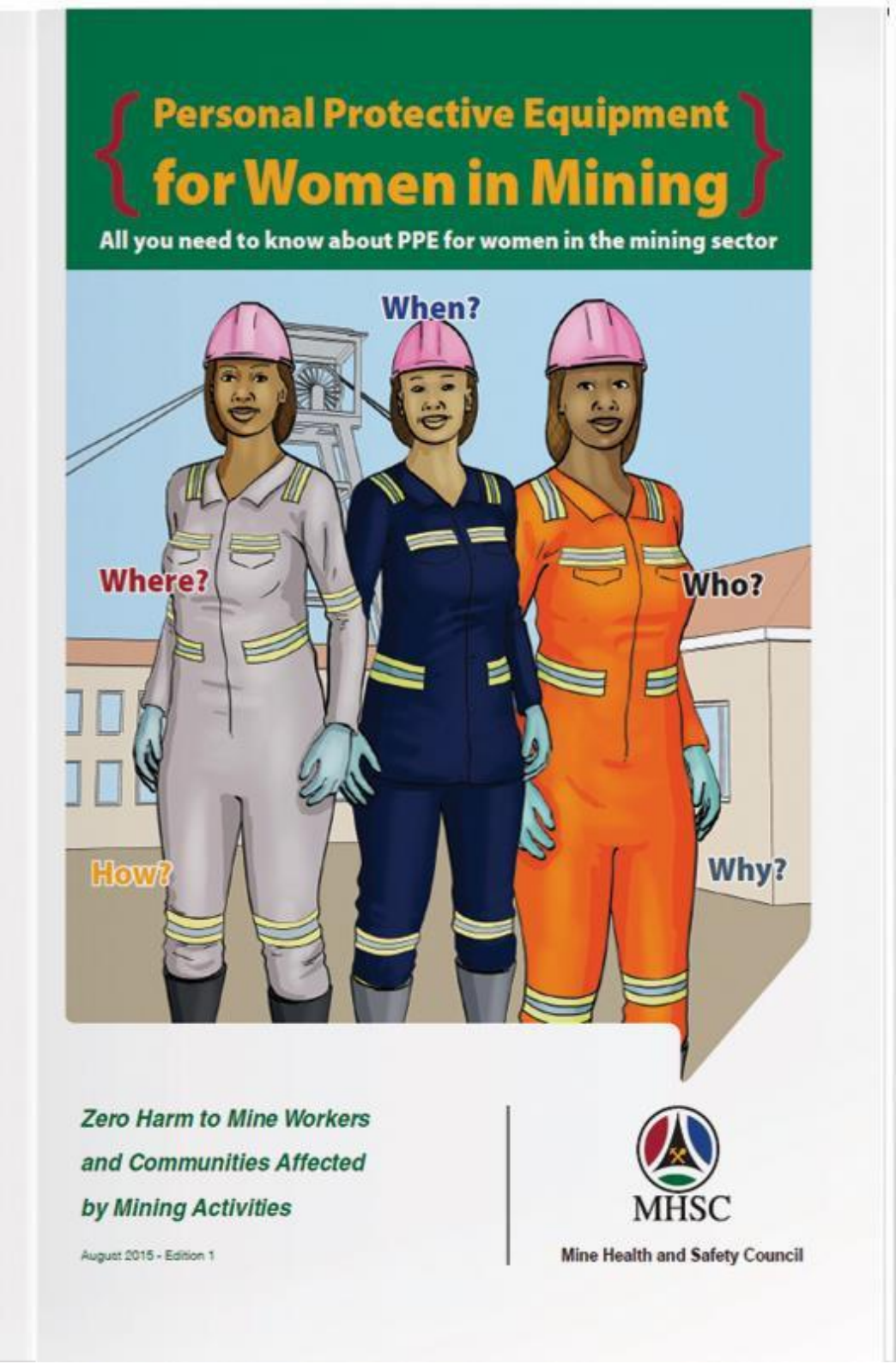

Figure 18.1. Personal protective equipment for women in mining

Source: MHSC (2015) (2)

18.1 Introduction

Historically, the International Labour Organization (ILO) had a Convention in place, since 1935, prohibiting the employment of women in underground mining work (Convention 45 of 1935) (3). However, this Convention was recently abrogated by the ILO at its 112th session, in 2024 (4). Nevertheless, many countries that initially ratified the banning of women from underground mining had already 'denounced' the Convention long before the ILO abrogation. These countries include Australia (1988), Canada (1978), Chile (1997), and South Africa (1996) and they are now signatories to the ILO's Convention 176, which covers the rights of all workers, regardless of gender (5).

In the view of the ILO, contrary to the old approach based on the outright prohibition of underground work for all female workers, modern standards in the South African mining industry (SAMI) focus on risk assessment and risk management and provide for sufficient preventive and protective measures for mineworkers, irrespective of gender, whether employed in surface or underground sites (6).

South African women have played a key role in the SAMI since long before they were legally allowed to work underground (from 1996 onwards). This meant that they worked in a range of above-ground jobs before they were able to become underground employees. As they have slowly become formal participants in all aspects of the mining industry's work, women have had to face a range of challenges and restrictions. Over the years, the industry has improved at identifying and dealing with these challenges, creating the conditions for more women to work underground.

18.2 Specific Legislation on Employment of Women

18.2.1 Mine Health and Safety Act and Occupational Health and Safety Act

The Mine Health and Safety Act No. 29 of 1996 (MHSA), as amended, and the Occupational Health and Safety Act No. 85 of 1993 (OHSA) are the primary custodians of occupational health and safety in the SAMI. The key aspects of these Acts are:

- Employers must conduct a risk assessment, which involves identifying hazards, assessing the risks that they pose to the health and safety of employees, and recording the results of the risk assessment.
- Employers must implement appropriate measures to eliminate or control hazards identified in the risk assessment.
- Employers must supply employees with information about, and train them in, the risks to their health and safety and the measures taken to eliminate or minimise them.
- Elected worker health and safety representatives and committees are entitled to participate in the risk assessment and control hazards; and
- Employees have a duty to take responsible steps to protect their own health and safety and that of other employees.

The MHSA does not explicitly name a single section that deals solely with the employment of women. However, it encompasses various provisions that indirectly address women's employment, particularly related to safety and fair treatment. These provisions are found in sections such as (7):

- Section 9(2), which requires employers to prepare and implement a code of practice (CoP) on

matters affecting health and safety, including the selection and provision of personal protective equipment (PPE) for women (8).

- Section 22, which emphasises the responsibility of all employees, including women, to protect their own health and safety and the health and safety of others.
- The constitution of the Mining Qualification Authority (MQA) under the MHSA section 3.1 (b)(iv-v), which addresses the redress of past unfair discrimination in education, training, and employment opportunities, which previously disadvantaged women, in order to contribute to the full personal development of each learner and the social and economic development of the nation at large.

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Similar to the MHSA, the OHSA does not have a specific section solely dedicated to the employment of women (9). However, it is crucial to understand how the OHSA, in conjunction with other laws like the Basic Conditions of Employment Act No. 75 of 1997 (BCEA) and the Employment Equity Act No. 55 of 1998 (EEA), addresses the health and safety of female employees, particularly during pregnancy and after childbirth.

18.2.2 Constitution of the Republic of South Africa

The Constitution of the Republic of South Africa, 1996 makes specific provisions regarding a Bill of Rights, enshrining equality and removing barriers to women's employment in the SAMI (10).

Regarding equality, section 9(4) of the Constitution indicates that no person may unfairly discriminate directly or indirectly against anyone on one or more grounds, including race, gender, sex, pregnancy, marital status, ethnic and social origin, colour, sexual orientation, age, disability, religion, conscience, belief, culture, language, and birth.

Section 22 of the Constitution guarantees every citizen the right to choose their trade, occupation, or profession freely, but stipulates that the practice of a trade, occupation, or profession may be regulated by law.

Regarding labour relations, section 23 (1) of the Constitution indicates that everyone has the right to fair labour practices, which includes women.

18.2.3 Employment Equity Act

Section 6 of the EEA prohibits unfair discrimination, as follows: *"No person may unfairly discriminate, directly or indirectly, against an employee, in any employment policy or practice, on one or more grounds including race, gender, sex, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language and birth"* (11).

However, section 6(2) of the EEA provides a defense to a claim of unfair discrimination, allowing the employer to "*distinguish, exclude or prefer any person on the basis of an inherent requirement of the job."*

Under the provisions of the EEA, the Department of Employment and Labour (DoEL) issued its Code of Good Practice on the Prevention and Elimination of Harassment in the Workplace (12). The Code specifically recognises gender-based violence (GBV) as a form of harassment, which is prohibited by the EEA. The Code is inevitably considered when determining whether an employer should be held vicariously liable for the conduct of perpetrators of harassment (including GBV), in terms of section 60 of the EEA. The Code implores employers to have clear policies and effective practices in place to manage and eliminate harassment within the workplace.

This code of good practice was in recognition of the ILO Convention No. 190 on violence and harassment, which acknowledges that GBV and harassment disproportionately affects women and girls. The Convention recognises that an inclusive, integrated, and gender-responsive approach, which tackles underlying causes and risk factors, including gender stereotypes, multiple and intersecting forms of discrimination, and unequal gender-based power relations, is essential to ending violence and harassment in the world of work (13).

18.2.4 Basic Conditions of Employment Act

The BCEA makes specific provisions for women in the workplace, particularly regarding maternity leave and protection of pregnant and breastfeeding employees, as is required by the Bill of Rights (14).

Section 25 of the BCEA provides that a pregnant employee is entitled to at least four consecutive months of maternity leave. Section 26(1) of the BCEA indicates that no employer may require or permit a pregnant employee, nor an employee who is nursing her child, to perform work that is hazardous to her health or the health of her child.

Section 26(2) of the BCEA clarifies that during an employee's pregnancy, and for a period of six months after the birth of her child, her employer must offer her suitable alternative employment, on terms and conditions that are no less favourable than her ordinary terms and conditions of employment, if:

a) *"the employee is required to perform night work, as defined in section 17(1) or her work poses a danger to her health or safety or that of her child;"* and

b) *"it is practicable for the employer to do so."*

The Code of Good Practice on the Protection of Employees During Pregnancy and After the Birth of a Child, section 5: Protecting the Health of Pregnant and Breast-feeding Employees, states:

"5.1 Section 26(1) of the BCEA prohibits employers from requiring or permitting a pregnant employee or an employee who is breast-feeding to perform work that is hazardous to the health of the employee or the health of her child. Employers of women of childbearing age are required, therefore, to assess and control risks to the health of pregnant or breast-feeding employees and that of the foetus or child.

5.2 Employers should identify, record, and regularly review:

- *potential risks to pregnant or breast-feeding employees within the workplace*
- *protective measures and adjustments to working arrangements for pregnant or breast-feeding employees*

5.3 Where appropriate, employers should also maintain a list of employment positions not involving risk to which pregnant or breast- feeding employees could be transferred

5.4 Employers should inform employees about hazards to pregnant and breast-feeding employees and of the importance of immediate notification of pregnancy.

5.5 Workplace policies should encourage women employees to inform employers of their pregnancy as early as possible to ensure that the employer is able to identify and assess risks and take appropriate preventive measures.

5.6 The employer should keep a record of every notification of pregnancy.

5.7 When an employee notifies an employer that she is pregnant her situation in the workplace should be evaluated. The evaluation should include:

5.7.1 an examination of the employee's physical condition by a qualified medical professional;

5.7.2 the employee's job;

5.7.3 workplace practices and potential workplace exposures that may affect the employee.

5.8 If the evaluation reveals that there is a risk to the health or safety of the pregnant employee or the foetus, the employer must:

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5.8.1 Inform the employee of the risk;

5.8.2 after consulting the employee and her representative, if any, determine what steps should be taken to prevent the exposure of the employee to the risk by adjusting the employee's working conditions.

5.9 The employee should be given appropriate training in the hazards and the preventive measures taken.

5.10 If there is any uncertainty or concern about whether an employee's workstation or working conditions should be adjusted, it may be appropriate in certain circumstances to consult an occupational health practitioner. If appropriate adjustments cannot be made, the employee should be transferred to an alternative position in accordance with section 26(2) of the BCEA.

5.11 Employers must keep the risk assessment for expectant or new mothers under regular review. The possibility of damage to the health of the fetus may vary during the different stages of pregnancy. There are also different risks to consider for workers who are breast-feeding.

5.12 Arrangements should be made for pregnant and breast-feeding employees to be able to attend antenatal and postnatal clinics as required during pregnancy and after birth.

5.13 Arrangements should be made for employees who are breast-feeding to have breaks of 30 minutes twice per day for breast-feeding or expressing milk each working day for the first six months of the child's life.

5.14 Where there is an occupational health service at a workplace, appropriate records should be kept of pregnancies and the outcome of pregnancies, including any complications in the condition of the employee or child."

18.2.5 Pregnancy and maternity leave for women in mining

Most women can continue to work during pregnancy. For how long depends on the nature of the job, the risks associated with the job, and personal risk for medical or obstetric problems. Occupational health and

safety concerns are about biological and physiological issues arising out of pregnancy and interacting with workplace hazards and risks.

There is a duty of care to provide a safe system of work to women of reproductive age, their unborn children, and all working mothers who are breastfeeding. At the same time, the right to equal opportunities and fairness must be recognised. Employment of women requires specific action to ensure that there is no significant risk of exposure that may affect their reproduction, health, and safety before and during pregnancy, nor that of the unborn child or mother and child during breastfeeding.

Legislated practice in the SAMI is that pregnant women should be removed from hazardous working environments and given alternative risk-free jobs until they go on maternity leave (15), (16).

18.3 Occupational Health, Hygiene, and Security

The fact that almost every woman who is physically able to work underground will be of childbearing age also has implications for that work. No pregnant woman may work underground, and the mine is obligated to provide safe above-groundwork during pregnancy, maternity leave, and breastfeeding. Additionally, some underground tasks may have a physiological effect on women, but not on men.

18.3.1 Limitations of the current sanitary amenities

There are several key hygiene limitations faced by women in mining (WiM), including (17) (18):

- No/limited access to underground toilet facilities
- Unhygienic toilet conditions
- Hand-washing facilities for after-toilet use are unavailable
- Underground toilets are unisex
- Inadequate access to sanitary bins, to dispose of sanitary towels, underground. This results in women avoiding changing sanitary towels until they are on the surface
- Incorrectly specified PPE can make it difficult when going to the bathroom
- Inadequate space
- Inadequate sanitary facilities

18.3.1.1 Women-only dedicated bathroom facilities

Women need access to adequate bathroom facilities, especially when they are menstruating. By implementing sanitary bins in the women's bathroom, women would feel more comfortable changing their sanitary pads during their mensuration cycles (18).

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A sanitary bin is a special receptacle that allows women to throw away their sanitary towels. By using this bin, the health and safety standards would not be impacted, as women would then not be forced to leave used sanitary towels lying around. Leakage may occur if a woman prolongs the changing of her sanitary towel, due to the absence of suitable disposal bins.

Currently, when women work underground, they choose to dispose of their sanitary towels by either burying them or carrying them around until they reach the surface (18). These practices can drastically impact health, safety, and comfort.

18.3.1.2 Improving sanitary amenities

To reduce the risk of infections, chaffing, further discomfort, and loss of productivity, mines should consider:

- Providing additional toilets per workstation – while keeping in mind that the MHSA mandates the provision of one toilet per 30 workers (men and women)
- Providing additional toilets that are not far to reach from work stations
- Demarcating toilets for men and women
- Equipping all toilets with toilet paper, hand-washing facilities, soap, hand sanitiser, and bins
- Allowing access to water for hand-washing facilities – for hygiene purposes
- Lighting up the bathroom areas, and securing the doors to make the sanitary facilities safe for women

Most importantly, mines should clearly demarcate toilets for 'men' and 'women', and then put safety, health, and environment (SHE) bins or sanitary bins into the women's bathrooms. This would make women feel more comfortable going to the bathroom, allowing them to maintain their privacy, dignity, and pride, and help to protect them from abuse.

When designing sanitary amenities, the specific needs of women need to be considered. By supplying the toilet facilities women require, they will feel more confident about working underground and more welcomed as part of the team. The toilet facilities also need to be cleaned daily and properly.

Providing women with a selection of overalls enables them to choose which suits them best, in terms of sanitary requirements. When selecting overalls, a woman must also take into consideration the number of times that she may need to go to the bathroom. If she needs the bathroom often, it is highly recommended that she uses a two-piece overall. If she doesn't need to go as often, a one-piece overall will be more suited for her. The suitability of overalls also depends on the working environment. Colour of clothing also plays a role. If a woman works underground, then it is preferable to supply her with dark-coloured overalls to disguise any stains, should she be menstruating. Incorporating women into the workforce requires a WiM PPE programme that has buy-in from a variety of stakeholders.

Before beginning with the design and implementation of such a programme, it is necessary to bring all the relevant stakeholders together to have a constructive discussion on the motivation. Stakeholders' workshops should include representatives from these disciplines (19):

- Human resources
- Core operations (mining and processing)
- Recruitment
- Communications
- Organisational development
- Community development
- Training
- Local community
- Women workers/WiM groups
- Unions and/or organised labour
- Occupational health and safety
- Employee relations

Buy-in could be achieved by conducting workshops that allow all stakeholders to contribute their point of view regarding the programme. This process, although time consuming and sometimes frustrating, is essential for creating a sense of stakeholder ownership, which eventually results in the efficient

implementation of the programme. After the workshop is completed, the conclusions arising from it should be communicated across the organisation so that all staff are aware of the upcoming programme, its goals, and the implementation strategy.

18.3.1.3 Health factors to consider during the workshop process

Inadequate sanitary amenities for women working underground cause them to:

- Not drink enough water so that they do not need to urinate often
- Suppress the urge to urinate
- Not change sanitary towels regularly
- Not understand the concept of good personal hygiene and take responsibility for it

18.3.1.4 Hygiene and toilet facility requirements to consider

Sanitary amenities for women should be available in the workplace (underground, pits) and include:

- Hygienic and regularly emptied SHE bins
- Well-lit and appropriately located toilets that are safe to use
- Dedicated female toilets, clearly marked
- Lockable doors on toilets
- Adequate toilet paper and wash basin/water/soap to wash hands

18.3.2 Sexual harassment

According to Pons and Deale (2010), sexual harassment is regarded as *"unwanted conduct of a sexual nature"* and may include *"unwelcome physical, verbal or non-verbal conduct*" (15) (20). Physical conduct of a sexual nature refers to all unwanted physical contact, such as brushing up against a person, touching a person, or forced fondling, and it may also include sexual assault and rape. Verbal forms of sexual harassment include, among others, unwelcome innuendoes, suggestions and hints, comments with sexual overtones, sexual stories or jokes, whistling, and repeatedly asking someone out. Non-verbal forms of sexual harassment refer to unwelcome gestures, including staring at someone, the sending of email messages of a sexual nature, and the unwelcome display of sexually explicit pictures and objects (20).

Quid pro quo harassment relates to a situation where a victim is coerced into acceding to the advances of a superior (employer, supervisor, or manager) or co-employee in exchange for work-related benefits (such as promotion, training, discipline, dismissal, or salary increment) (20). Sexual favouritism refers to a situation where a superior rewards only those who respond to their sexual advances, while other deserving employees, who do not submit themselves to any sexual advances, are denied promotions, merit rating, or salary increases (20).

Sexual harassment is a form of gender discrimination that is, unfortunately, pervasive in the SAMI. The problem has become increasingly evident, as gender diversity in the workforce increases (1).

Sexual harassment is not a phenomenon that occurs in isolation, but rather emerges from a lack of gender education, and unequal and problematic gender relations (19). Addressing sexual harassment effectively requires that broader gender relations are addressed, challenged, and changed. This requires multiple approaches, including:

- Developing gender awareness
- Defining or clarifying what constitutes sexual harassment

- Knowing and implementing relevant legislation
- Developing appropriate gender-sensitive responses to the problem

More women are taking up opportunities to enter the mining sector. They are also increasingly undertaking work in underground operations, which indicates that progress is being made towards achieving gender equality in work opportunities within the sector. However, unless women can be assured of a safe, fair, and conducive work environment, free from discrimination and harassment, true transformation cannot be attained. In fact, the potential threat of sexual harassment and sexual favouritism is cited as a major barrier to the entry of women in the mining sector, particularly in positions underground.

Women working in the male-dominated mining environment face a range of obstacles, including sexual harassment (6). Women appointed in core positions work side by side with men, often in isolation, and are frequently at risk of sexual abuse and/or harassment. Employees working underground in the mine are in close proximity to one another while being transported from the surface to the workplace underground, which also increases the risk of sexual harassment. Furthermore, male colleagues often refuse to provide support in the form of camaraderie and teamwork to their new female colleagues, denying them the necessary informal job induction process needed for success. Instead, they regularly ignore, harass, and undermine their new female colleagues (17).

Gender discrimination and sexual harassment could affect women's psychological health, generating stress-related reactions such as emotional trauma, anxiety, depression, anger, and low self-esteem. Discrimination may also affect their physical health, causing stress-related diseases such as sleep disorders, headaches, stomach problems, and ulcers (21).

In light of the above background, the problem statement can be outlined as follows: On the one hand, mining companies are obliged to reach the set targets of the Mining Charter (22). Failing to reach these targets could result in mining companies losing their licenses to operate. On the other hand, the requirement of the Mining Charter to include more women in the core business of mining has broadened employment opportunities for women and, therefore, contributed to decreasing poverty in South Africa. However, women are now exposed to various new challenges and risks in the workplace, including sexual harassment.

Based on the problem statement described above, it is necessary, first, to conceptualise sexual harassment according to the literature; second, to provide theoretical explanations for the occurrence of sexual harassment in the mining industry; third, to explore the occurrence of sexual harassment among WiM according to the literature; fourth, to determine sexual harassment issues among WiM at selected mines; and last, to provide some recommendations to address sexual harassment in the mining industry.

It is evident from research conducted, globally, that women working in the core business of the mining sector are still viewed as sexual objects and are still subjected to sexual harassment of some kind. The main findings of the research are discussed below.

In South Africa, researchers who have revealed serious incidents of sexual harassment include Botha (2016) (23) and Rawoot (2014) (24). Reported sexual harassment incidents, taking place on a daily basis, include whistling; name calling; use of vulgar or derogatory language; display of body parts; and physical contact, ranging from touching to sexual assault and rape; and the exchange of sexual favours for a promotion. It is known that the number of reported incidents of women miners experiencing harassment and inhumane treatment by fellow workers, in their underground workplaces, is of particular concern. No employee should experience any sort of intimidation at the workplace that inhibits their ability to reach their productive potential (25).

The Minerals Council South Africa (MCSA) recently published a framework for the foundational

measures required to manage and control sexual and gender-based violence (SGBV) and gender-based violence and femicide (GBVF). The framework consists of the following foundational measures:

- Reaffirming zero tolerance for GBVF, by proposing a strategy for industry to implement using leadership forums and working groups
- Developing gender-diverse and inclusion policies that commit to gender equality, diversity, inclusion, and integration of gender equity in systems, structures, and operations
- Providing reporting systems for gender-diversity issues, by developing a data collection system to report gender-diversity metrics
- Initiating unconscious bias against women training, to transform the existing male-dominated culture
- Deploying ongoing companywide pulse check surveys, to ensure that an enabling and healthy working environment is created for all to thrive and realise their full potential
- Building an inclusive physical environment and providing gender-sensitive PPE for women, to accommodate their specific physical requirements for better performance

18.3.2.1 Effects of sexual harassment

On the victim:

- Degraded, humiliated, ashamed
- Depression, anxiety, shock, denial
- Low self-esteem
- Sexual problems

On the mining house:

- Financial losses
- Lack of productivity
- Factionalism
- Tarnished image (bad public relations)
- Resignations

On the perpetrator:

- Tarnished image
- Reduced social standing
- Loss of income
- Criminal record

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18.3.2.2 Addressing sexual harassment in the mining industry

It is of paramount importance that mining companies follow these steps to ensure a workplace free from sexual harassment:

- A good working sexual harassment policy must be developed. The policy statement must emphasise that sexual harassment in the workplace will not be tolerated.
- Training on the sexual harassment policy must be provided to all employees, old and new.
- The policy should also explain the procedure that should be followed by employees who are victims of sexual harassment.
- A mechanism for reporting sexual harassment must be developed. Employees must be encouraged

to speak out about these incidents.
- Sexual harassment complaints must be thoroughly investigated.
- Management must take prompt disciplinary action against those who commit sexual harassment, and take appropriate action to protect their victims.

18.3.2.3 What does the South African Constitution say?

Chapter 2 of the Constitution of the Republic of South Africa, the Bill of Rights, outlines the inalienable human rights to which all people are entitled (10), as follows:

- The right to equality and human dignity
- The right to be respected
- The right to be informed
- The right to privacy
- The right to live and work in a safe and pleasant environment
- The right to freedom of expression and association

The Constitution thus forms the cornerstone for all interventions to promote gender equality and eliminate all forms of discrimination and sexism, including labour laws that prohibit sexual harassment in the workplace.

18.3.2.4 What does the Employment Equity Act say?

The EEA provides guidance in the Code of Good Practice on the Prevention and Elimination of Harassment in the Workplace. The guidance defines sexual harassment behaviour as unwelcome physical, verbal, and non-verbal contact or attention that the receiver perceives to be offensive, or that the perpetrator should know is unacceptable. Sexual harassment encompasses a range of behaviours that undermine the integrity, dignity, and right to equality of individuals. This includes, but is not limited to, unwelcome touching, whistling, sexual advances, sex-related jokes and/or insults, display of sexually-explicit pictures and objects, sexual assault, and rape. Abuse of power, such as trading professional favours and benefits in exchange for sexual favours, and sexual-based favouritism also constitute sexual harassment.

The EEA was promulgated to advance equity in the workplace, outlawing unfair discrimination to ensure equal opportunity and fair treatment for all employees. It also mandates affirmative action measures to redress the disadvantages in employment experienced ***by*** designated groups, ensuring their equitable representation in all occupational categories and levels in the workforce, including living conditions.

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18.3.2.5 What does the Basic Conditions of Employment Act say?

Many sexual harassment induction policies are ambiguous and are not implemented properly; they are wordy and are not communicated in Indigenous languages. Sexual harassment induction policies are based on the BCEA. The objectives of this Act are to:

- Enact legislation required by the Constitution
- Provide for procedures for the determination of circumstances under which discrimination is unfair
- Provide for measures to educate the public and raise public awareness on the importance of promoting equality
- Overcome unfair discrimination, hate speech, and sexual harassment
- Provide remedies for victims of unfair discrimination, hate speech, and harassment and for persons whose right to equality has been infringed

18.3.3 Health challenges and perceptions

Risk assessment is fundamental to the safe placement of female employees prior to or during pregnancy. **Figure 18.2** outlines the risk assessment flow to ensure that pregnant and/or breastfeeding female employees are not exposed to significant risk.

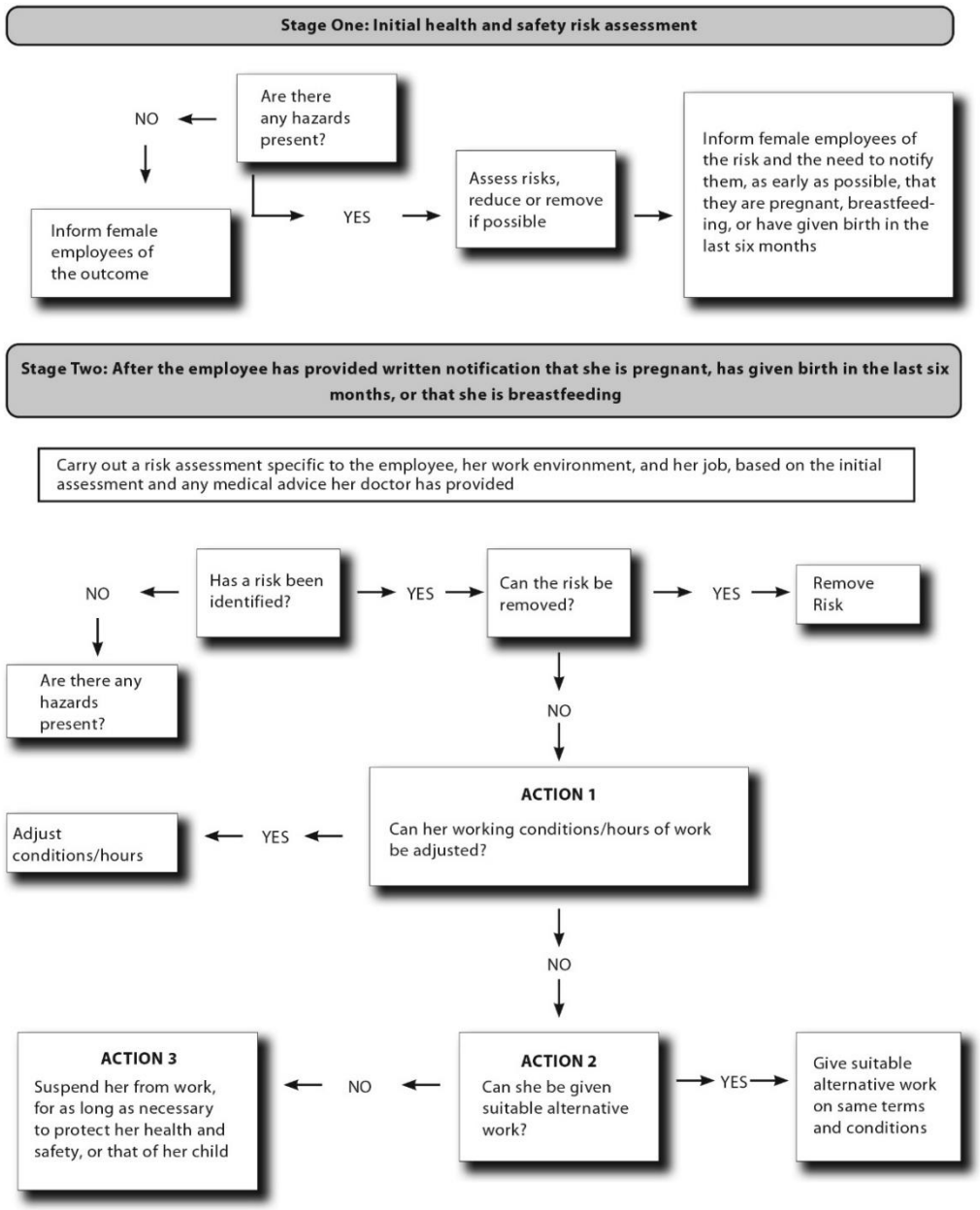

Figure 18.2. Risk assessment process for pregnancy and/or breastfeeding

Source: Kulkarni (2018) (26)

18.3.3.1 Supportive infrastructure

The BCEA requires the employer to accommodate the employee as far as is reasonably practicable when they are unable to meet the inherent requirements of the job. These accommodations can go beyond the direct duty of care, providing best practice support, such as:

18.3.3.1.1 Ablution facilities and change houses

One of the problems faced by women working underground and in heavy industries is the lack of appropriate ablution facilities and change houses (27). Because the mining and other heavy industries previously excluded women, facilities were only provided for men. In order for women to work in these environments, a number of practical changes need to take place. Ablution facilities and changing rooms have needed to be created for women, and even though these do not need to be separate, proper ablution facilities and private change houses are a necessity when female employees are engaged for reasons of privacy, protection, and dignity.

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Other occupational health and safety (OHS) challenges reported by participants in a study on challenges faced by women in the SAMI included unhygienic conditions and lack of access to adequate sanitary facilities while working underground (27). Slightly more than half (52.5%) of the participants complained about the latter in their workstations. The results also revealed that almost all participants (99.8%) complained about the unhygienic conditions of underground sanitary facilities: 37 (31.4%) rated them as 'poor' while 80 (67.8%) rated them as 'unacceptable'.

All participants complained about the lack of hand-washing stations at the sanitary facilities **(Figure 18.3**).

Figure 18.3. A sanitary facility underground

Source: Zungu (2012) (27)

Furthermore, the majority (90.6%) reported that existing underground sanitary facilities were not demarcated by gender, while 110 (95.7%) reported the lack of sanitary bins for disposal of used (soiled) sanitary towels. Consequently, almost all participants (96.4%) reported that they were unable to appropriately dispose of their soiled sanitary towels/pads in underground sanitary facilities, and were forced to dispose of them at the end of their shifts when they returned to the surface.

18.3.3.2 Work-life balance

Work-life balance has become a major factor in the new world of work; working mothers face particular challenges in this regard. Today, dual career families are the norm, and women are under a great deal of pressure to earn a good income while supporting the growth of children and taking care of other

responsibilities, such as elderly parents. This increased pressure is costing business in terms of attracting high-level recruits, staff retention, efficiency on the job (distractions), employee commitment, morale, and absenteeism (either stress related due to work/life conflict, or sick leave taken to fulfill family responsibilities). Reasonable accommodation of the additional burden that life places on women is recommended, as failing to recognise this will not only lead to over-exertion by the employee, but could also compromise health and safely.

18.3.3.3 Childcare

Children are typically the responsibility of their mothers. Access to childcare, particularly facilities that cater for shift work and long rosters for women in residential mining and industrial towns, could prove almost impossible. Like other working women – and unlike most of their male work colleagues – female miners are forced to balance their paid work with unpaid labour at home.

Trying to balance an eight-hour workday with household and child-raising responsibilities calls for long hours. Shift work becomes a major problem especially for women with family responsibilities; securing childcare proves to be an ongoing problem. Most of the women rely on informal supports through family members, but arranging childcare could be difficult, especially for single mothers.

For most women, the problem goes beyond the provision of alternative care. Shift work means that they are missing out on an important part of their families, and in particular, their children's lives.

Employees need to have the assurance that their children are safe in order to work in a focused and dedicated way. As an additional measure, especially in the South African social and security environment, involvement in ensuring safe childcare availability is recommended.

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18.3.3.4 Personal safety and security

Women working underground and in heavy industries face 'macho' (which is not the same as masculine) social environments. Hostility to women causes them to fear and/or experience sexual harassment, sexual intimidation, and/or assault. Their inability to cope with the physical challenges of working underground and, even if they can cope, finding the working environment just too unpleasant, causes many to leave the industry. In some mining communities, married women face employment discrimination, the rationale being that unmarried women are healthier, stronger, and not burdened with family responsibilities. Many women, for fear of further harassment and loss of employment, rarely report sexual exploitation. Serious health problems such as AIDS and other communicable diseases, which are uncommon among the tribal communities, are becoming rampant in mining towns, both among women mine labourers and among women in the communities to whom these diseases are transmitted by the men.

Women are more vulnerable in a society with the current levels of violence and sexual assaults; it is an issue that cannot be ignored and prevention is key. Safety and security measures should be in place and be revisited, enhanced, and scrutinised to ensure that they are sufficient to provide the necessary safety.

18.3.3.5 Personal protective equipment

Personal protective equipment is considered to be the last line of defense against hazards in the workplace. The limited availability of PPE for women is a critical workplace health and safety issue. In addition to undermining efforts to protect worker health and safety, lack of adequate PPE can be a barrier to equality of employment opportunity for women. In many cases, women requiring PPE are forced to `make-do` and wear equipment designed for men. Ill-fitting protective clothing and equipment could also mean that women entering certain `non-traditional` fields will be unable to perform efficiently the given tasks of the job.

Regarding the provision of PPE designed for women, change is slow. The lack of adequate or appropriate PPE for female workers is an increasing source of concern, as it results in serious health and safety issues. Government, PPE suppliers, standards-setting groups, employers, unions, joint health and safety committees, and workers themselves all have a role to play in the change process; and all stand to benefit from women having greater access to proper-fitting PPE.

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The mining industry is male-dominated and PPE is designed for a male body structure. Women surveyed on PPE reported having been diagnosed with various types of illnesses, such as ear infections and headaches (28). They also reported ailments such as back, joint, shoulder, and abdominal pains, which are musculoskeletal disorders associated with labour-intensive tasks, coupled with the prolonged standing involved in mining. Sore eyes were also reported, which they related to poorly fitting safety eye goggles that could allow exposure to dust particles from silica and other hazardous chemicals. The ill-fitting PPE could pose an OHS hazard for WiM as dust and dirt in mining environments can be highly abrasive. When inhaled, dust can cause systemic and lung diseases, and other respiratory ailments. Exposure to dust can also cause skin irritations and eye damage.

Table 18.1 shows some of the occupational health and safety challenges relating to PPE, reported in the South African gold and platinum mines in a study by Zungu (2013) (28).

Table 18.1. Occupational health and safety challenges relating to personal protective equipment, reported by participants

Challenges related to personal protective clothing	Percent
Overall (one-piece)	
Too tight and difficult to take off for toilet use	82%
Not comfortable and not friendly to use	19%
Two-piece overall pants	
after washing, making the size smaller	92%
Exposes the lower back (pants are too wide around waist)	80%
Two-piece overall top	
Too small at chest and breast	78%
Not comfortable to wear	22%
Hard hat	
Too heavy to carry with head lamp	87%
Causes headache at the end of the shift	14&
Gumboots	
Too big and heavy when walking long distances	95%
Causes corns and painful feet	5%
Safety shoes	
Sizes are too big for women's feet and do not fit well	90%
Only suitable for men	10%
Hand gloves	
Too hard, too big, and uncomfortable to work with	94%
End part too wide, allows dirt and water to enter inside	6%
Safety glasses	

Too big for women's faces (constant slipping and having to adjust them)	94%
Allow dust particles to get inside the eyes and cause sore eyes	6%
Dust mask	
Experience suffocation when wearing it	96%
Hearing protection	
Experienced itching and ear infections from earplugs	98%
Still hears noise with them in place	2%
Rescue pack, lamp battery, and securing belt	
Too heavy to carry and causes discomfort and chaffing on lower abdomen	95%
Causes back pain	5%

Source: Adapted from Zungu (2012) (27)

Some participants raised the issue of discomfort from PPE used; for example, small overall pants, large boot sizes, loose safety goggles, hard hats, masks, respirators, and rescue packs that they had to carry for the entire shift.

- **Safety goggles**: Badly fitting goggles allow dust and debris to pass between the gaps and irritate or damage the eyes. Safety goggles are used to protect the face from the effects of chemical splashes, dust, gases, and projectiles such as flying fragments and chips; therefore, face and eye protection are a necessity. Safety goggles must be worn when:
    - An impact hazard exists
    - Working with dust
    - Low visibility causes a probability of injury because of flying objects
- **Safety boots**: Boots that slip around on the foot, causing blisters and general discomfort, take the worker's focus off the job in hand. Boots that are too narrow around the calf could cause irritating movement, and the boot could even slip off. Socks that are too tight will be uncomfortable to wear for extended periods of time. Without effective foot protection, workers can:
    - Slip and fall on wet surfaces
    - Cause an electrostatic build-up
    - Suffer from cuts, abrasions, and perforations
- **Safety gloves**: Gloves that move around on the hands cause chaffing and rashes in the humid underground environment. Ill-fitting gloves can result in injury, errors, and a slower work rate when working with power tools and hazardous chemicals. When working in the mine, the female workforce requires hand/arm protection, especially if they are working with dangerous chemicals, hot liquids, and steam/gases. Without proper hand and arm protection, the following hazards may occur:
    - Extreme temperature changes – there is no control from cold to hot
    - Exposure to dangerous chemicals
    - Electric shocks
    - Equipment vibrations transmitted to hands and feet
    - Cuts and abrasions, which can lead to skin infections, diseases, and contamination
- **Hard hats**: Hard hats that are too big keep falling off, distracting the worker from her tasks and exposing her head to injury. It is advisable to use hair nets for women to protect their long hair from

entanglement in the machinery. Hats that are too large and heavy are not safe for WIM. Some technical considerations, when providing helmets or hard hats for women, include:

  - Consideration of the specifications provided by the South African National Standards (SANS) (1397)
  - Proper fit to allow for clearance between the shell and the suspension system, for ventilation and distribution of any impact
  - Use of lighter weights, designed from tougher plastics
  - V-Guards that accommodate different head sizes
  - Replacement of the helmet/hard hat if an impact occurs, even if damage is not noticeable
  - Replacement of head protection if wear and tear is noticed
  - Practical colour selection
  - Advice to women to consider their working environment and avoid hairstyles that render their hard hats ineffective

- **Ear protection**: Incorrectly fitting earmuffs and ear plugs allow noise to penetrate. Earmuffs that do not clip to the helmets cause them to fit incorrectly, allowing dust and noise to enter the ear and possibly cause damage. The mines do encourage the use of ear protection for all miners. By not wearing ear protection, miners can suffer from noise-induced hearing loss (NIHL).

- **Respirators**: Incorrectly fitted respiratory protection equipment keeps moving away from the nose, or is tightly fixed. Perfectly fitted respirators, such as dust masks, half-face, and full-face respirators, are required to safeguard workers from dust and other airborne hazards, depending on the specific hazards and required protection level.

- **Overalls**: Overalls that are too big require women to roll up the sleeves. This extra material could come undone during work tasks and get caught up in machinery. When looking into protective overalls for women, it is suggested that WiM consider items from the following list, depending on their job description:

  - Boiler suites
  - Clothing for cold, heat, and severe weather
  - Clothing that will protect them against machinery
  - High-visibility vests or jackets
  - Harnesses or life jackets
  - Option on one- or two-piece suits
  - Colour of PPE

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It is acknowledged that the findings of this study are based on participants' self-reported experiences. However, ill-fitting PPE fails in its purpose to protect the user. It undermines efforts to protect women, who are vulnerable employees, against OHS hazards in the workplace.

Women differ from men in size and shape and so should the dimensions of their PPE. Some areas of protective equipment need to be specifically designed for the female worker to ensure proper fit, comfort, and protection. Manufacturers play a crucial role in the provision of PPE. The range (or lack) of sizes and designs can affect not only how women are protected, but also how well they are able to do their jobs. The mandatory code of practice on PPE for women in the SAMI references the following standards, specifying certain types and measurements of clothing wear designed for women's comfort:

- SANS 434 – General protective clothing
- SANS 1891 – Performance requirements for clothing

- SANS 492 – Protective and safety footwear
- SANS 1228 - Protective and safety gloves
- SANS 511 – Women's workwear

These PPE can be found at various suppliers in South Africa, including Dromex, Sheq Safety, Trust Health & Safety, Pienaar Bros, and zdi.co.za. These companies offer a range of PPE products, including workwear, safety suits, and other protective gear, that meet the SANS 434 standard.

18.3.3.6 Increased awareness for women in mining (looking after their personal protective equipment)

The objective of this unit is to empower women to know their PPE and provide recommendations for the maintenance of PPE.

By creating awareness, making recommendations, and suggesting methods on how to maintain equipment, staff will be educated on how to care for their PPE. Mines can create awareness in many different ways, such as quarterly workshops; awareness courses, where new employees are inducted, and hanging posters in pertinent areas, such as a waiting place or change house.

18.3.3.6.1 Head protection awareness.

There is a proper way to maintain head protection. However, this is largely impacted by the correct use of the equipment, which includes:

- Replacing the suspension system when damaged or excessive wear is noticed; it is not always necessary to replace the entire hard hat if the suspension system has started to deteriorate, or when tears are noticed on the suspension system
- Replacing the helmet if it sustains an impact, even if there is no noticeable mark

To maintain head protection, it is suggested that mines:

- Create a reporting structure that allows women to report if an impact has occurred, and give them immediate access to new helmets
- Provide special cleaning products in the change house and bathrooms to clean dust off the helmet
- Consider implementing storage units, which will encourage women to leave their helmets on site

18.3.3.6.2 Face and eye protection awareness

Mines need to ensure that female employees wear eye protection equipment daily, to eliminate the risk of injury to the eyes.

The correct use of eye protection equipment includes:

- Goggles should never be worn loose, as this exposes certain areas of the eye to hazards
- Goggles should fit the face properly, completely covering the eyes and immediate facial structure.
- Full-time use of goggles must be encouraged and promoted.
- The wearing of eye protection must be enforced for working environments that require them.
- Women who need prescribed eye wear must use this prescription eye wear.
- Even if women wear prescribed eye wear, they should still wear appropriate eye protection, as this will protect the eye from dust and any hazardous environments to which they are they are exposed.
- Caution should be exercised with the use of both metal frame protective devices and frames of spectacles for women, particularly in electrically hazardous areas of the mines.

- Eye protection should be designed to provide both adequate ventilation and splash protection, and used appropriately.
- Disinfectant should be used if the PPE is shared among women, ensuring that the equipment is cleaned properly (even if seldom shared).
- Eye wear should not be restricting in terms of vision and movement.

Maintenance of equipment is essential, and includes:

- Providing disinfectant in bathrooms to enable women to clean the equipment properly, so that it is ready for the next person (if shared).
- Allowing women to fit their own goggles; by doing this, they will want to look after and maintain them.

18.3.3.6.3 Hearing protection awareness

Mines need to promote the use and maintenance of hearing protection. However, mines cannot promote this unless workers are aware of the correct usage of the PPE. The proper use includes:

- Performing regular ear screening, to rule out any ear infections and to check hearing deterioration
- Providing an employee with earmuffs instead of ear plugs if they have an ear infection – this will prevent the spread of the ear infection
- Encouraging women to clean hands before handling ear plugs, reducing the introduction of ear infections
- Ensuring that ear plugs are made out of waxed cotton, foam, silicone rubber, or fibreglass wool – these materials are self-floating and will work as well as moulded ear plugs
- Using 100% PVC free, soft, slow recovery foam that shapes itself easily into the ear canal
- Disinfecting reusable ear plugs after every use – this will prevent ear infections

Methods used in maintaining ear plugs:

- Cleaning ear plugs after use – this will require disinfection
- Washing hands before and after touching ear plugs – this will prevent infections

18.3.3.6.4 Hand and arm protection awareness

By creating awareness of hand and arm protection, a significant decrease in accidents and injuries may occur. In order for this to happen, PPE needs to be worn correctly, including:

- Wearing durable gloves that are designed for a particular task
- Using coated fabric gloves that are made from cotton flannel, with napping on one side
- Ensuring that the glove's finger length, width, and palm circumference fit the average woman's hand
- Ensuring gloves are comfortable, and not clumsy or awkward to wear
- Ensuring gloves have a safe and secure grip, which will prevent heavy and large tools from slipping out of the hands
- Fitting gloves correctly, ensuring there are no gaps that expose skin or allow water or material to enter

In order for gloves to last longer, it is recommended that:

- They are treated to make them flame retardant and acid resistant.
- Women are educated about effective glove care.

18.3.3.6.5 Respiratory protection awareness

It is vital that mines ensure that the respiratory protection equipment is maintained and looked after efficiently, as this can reduce lung infections as well as potential respiratory diseases.

Dust masks are entry-level protection equipment. These are worn by many miners during their daily activities. In higher risk environments, a more tailored approach must be considered, which involves evaluating constant dust, gas, and chemical exposure.

The use of respirators helps reduce the chances of major infections. Mines need to ensure that their female workforce is aware of the damage that can be caused by insufficient lung protection. Dust masks are worn in many South African mines.

18.3.3.6.6 Body protection awareness

Creating body protection awareness is vital and necessary. This can be done on a number of levels, such as putting up posters and doing regular employee workshops and training sessions.

For this to be effective, mines need first to ensure the correct use of body protection equipment, such as:

- Wearing correctly fitting overalls
- Providing overall materials that 'breath', making them comfortable to wear, as the body is then able to maintain its internal temperature without 'heat stress'

These practices have a positive impact of female workers' productivity.

18.3.3.6.7 Foot and leg protection awareness

As well as providing proper fitting PPE, mines need to educate their staff on how to maintain their boots adequately. Methods that allow for boots to be properly maintained include:

- Assessing women's boots every three months, so as to combat the deterioration of the insoles of the boot, depending on the conditions and the environment
- Providing cleaning kits in the change rooms and bathrooms that allow women to clean their boots after their shift, if there is no cleaning staff maintaining the PPE
- Providing an onsite storage unit to enforce a requirement that women leave their boots onsite. Management can then validate if the workers need new boots or not. Some mines already have these facilities in place.

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18.3.3.7 Mining equipment

There are work tasks that female miners generally find more difficult to complete than male miners, due to their physiological differences. Mining equipment such as drills and front-end loaders were designed to fit men. When mines started to recruit women, changes could not occur rapidly enough, resulting in both men and women having to share such equipment.

Manual handling injuries represent one of the main sources of back injury and musculoskeletal disorders for workers. Mechanical equipment injuries account for a high proportion of all work-related injuries in all occupations. The design of machinery and equipment has proven to be a major cause of injury when not designed or used properly, constituting a major risk for women as most of the PPE and tools used are

designed based on male populations.

Women workers who are not in the upper levels of height and weight are, therefore, not properly equipped for their protection. For this reason, the concept of maximum weight to be manually handled by women needs to be revised in the context of current technical knowledge and socio-medical trends. Intra-sex variations need to be considered.

National standards for manual handling should move away from regulating weight limits that differ between female and male workers, adopting instead a non-discriminatory approach based on individual risk assessment. Control anthropometric standards need to be based on human variability, more than on 'model' populations (29).

18.4 Work Capacity

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Women experience significantly more physiological strain than men when performing mining tasks. The aerobic capacity (physical work capacity) of women is typically 15–30% below the values of their male counterparts (30). Aerobic capacity refers to the maximal oxygen uptake that provides a quantitative measure of a person's ability to sustain high-intensity physical work for longer than five minutes. This means that women work closer to their aerobic capacity than men and are, therefore, more likely to become fatigued. Fatigue is operationally defined as the 'reduced muscular ability to continue an existing effort' (31). Elevated levels of fatigue can cause reduced performance and productivity in the workplace, and increase the risk of accidents and injuries occurring.

Mine work also requires manual handling of equipment and tools. These equipment and tools are designed to accommodate the size and strength of men. Manual tasks can often be related to back injuries and musculoskeletal disorders in workers. In general, the manual material-handling capabilities of women are substantially lower than those of men. These differences may be attributed primarily to differences in muscle strength. Women only have 55% of men's upper-body strength and 72% of their lower-body or leg strength. On average, a woman's lifting strength is 60–70% of that of a man (30).

18.4.1 Physiology, anatomy, and physical work capacity

Men and women differ anatomically and physiologically, primarily due to hormonal influences and genetic factors (32). Men typically have higher levels of testosterone, leading to increased muscle mass, stronger bones, and deeper voices. Women have ovaries and a uterus, facilitating reproductive functions, while men have testes and a penis. These differences also extend to body composition, with men having more muscle mass and bone density, and women having a higher percentage of body fat (33).

Men are different from women, as is self-evident. They are different in aptitude, skill, and behaviour, but so is every individual person, such as:

- Women may, in many cases, be superior to men, especially in jobs requiring accuracy, patience, alertness, and perseverance.
- With regards to physical strength, women are weaker than men, usually attaining 60–90% of men's muscle strength and work output.
- With regards to fitness levels, the maximal aerobic power, such as the maximal oxygen uptake as an expression of an individual's physical work capacity, is, for females, on average 65–75% of that of men. In the case of heavy or very heavy manual work, women exposed to the same physical workload as men may have to exert themselves some 25–30% more than men.

- With regards to size, men are generally taller than women. Although more flexible than men, differences in muscle mass, body composition, and size can place women at risk of injury.
- Based on statistics from a SIMRAC study on heat tolerance of female miners, approximately 4% of the women tested failed the heat tolerance screening. The corresponding figure for male mineworkers ranges between 0.5–4%. The difference between general heat tolerance of males and females is not as significant as generally believed, being 35% and 5%, respectively (34).

18.4.2 Ergonomics

Despite various liberalisation and feminisation processes, with regard to gender and sex roles, traditionalistic typologies, especially in terms of occupational roles, are seemingly persistent in relevant theoretical discourses, as well as in practice. One of the key issues remains the terrain of physical work. Although women all over the world have been involved in mining activities for centuries, the mining industry has not been an obvious career choice for women. In South Africa, new mining legislation aims to rectify previous inequalities and disadvantages in the mining sector, and specifically provides for the inclusion of women in core mining activities. Although well intended, women's involvement in the core business of mining also exposes them to various hazards related to mine work (27).

Mining has been considered a very masculine industry due to its heavily male-dominated workforce. The heavily manual character of mine work, together with the dirt and risk associated with it, makes the male miner the typical labourer (35). In addition, the mining industry has not been an obvious career choice and preferred place of employment for women.

If women are employed in core mining activities, then they should hold positions equivalent to those of men, filling positions that include mining, metallurgy, engineering, and geology, which are crucial for the operational aspects of a mine (36). They are also required to do the manual labour associated with mining.

Literature has revealed that working tools and equipment are often designed to be used by average-sized men, for example (35):

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- Handle size and tool weight are designed to accommodate the size and strength of men, yet the average hand length of women is shorter than the average man's.
- Furthermore, the grip of tools is typically too thick and women workers do not receive special training on how best to use tools and equipment designed for men.

Women are also involved in technical and mechanical mining operations. However, pregnant women are not allowed to enter work areas in which they could be exposed to radiation. A study of women in the South African mining industry revealed that no mining equipment and tools are banned from use by women, with the exception of load haul dump (LHD) machines (18). When female employees initially operated these machines, many complaints were lodged due to the vibration caused. The female participants indicated that vibration caused by the LHD machines had a negative impact on their health and interfered with their menstrual cycles. As a result, women are no longer allowed to operate LHD equipment.

Although female employees are employed as rock drill and winch operators, the female participants reported that these types of equipment are too difficult for them to operate because they are too heavy. Furthermore, the participants from the management target group at the phosphate mine indicated that they experienced problems when women operated rubber dozers, as noted in the following comment:

> *"What happens, because that dozer drills the whole time, it interferes with females' monthly period.*

There are complaints, they go to medical doctors, the doctors picked it up, it seriously disturbed them, it makes them seriously sick, you can check at a couple of mines we have done our homework, they experience the same problem. They rather put them in the track dozer and not in the rubber dozer, because the rubber dozer is the one that vibrates the whole time. I have had four cases of ladies who had medical problems with regard to that and we had to move them around to the track dozers instead of the rubber dozers" (18).

From the interviews and focus group discussions held with the participants in management positions, it became clear that although job reservation does not exist and women are employed in all sections at the mines, women do not have the physical strength and ability to be employed in all core mining positions. According to the participants, it is important to consider job specifications and requirements when appointing women in positions that require physical strength (18).

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Women are often appointed in core mining positions without having the physical ability to cope with the requirements of these positions, so male employees have to assist and support their female colleagues to do their jobs properly. This often leads to frustration on the side of the male co-workers and contributes to a negative attitude towards WiM. Male co-workers are often unwilling to assist their female colleagues because they feel that since women are appointed in these positions, and receive equal salaries, they should do their jobs on their own (18).

The following qualitative data from the study provides an indication of some participants' opinions with regard to the physical ability of women employed in core mine positions:

- It is about the company's requirement and selection procedures and plans.
- Every human being has his own strength and weaknesses. There are women who are stronger than men and there are men stronger than women.
- The evaluative process of recruitment for a position/job should include determination of whether candidates are physically strong enough to fill specific positions. In the past, we have often made mistakes with the appointment of women by not looking at the requirements of the position/job.
- For heavy duty jobs, the male colleagues often have to assist women who are not physically strong enough to do their jobs and they become easily frustrated and annoyed with their female colleagues.
- It depends on the type of work they do. For example, women find it difficult to do mechanical types of work that requires physical strength. On the other hand, women perform well if they do work that requires little or no physical hard labour. But as soon as they start to do heavy work or work that needs some physical strength or power, they cannot do it.

A female employee can do any job that she is qualified to do, subject to her fulfilling the physical and functional requirements, such as the inherent requirements for that specific job. The health and safety of an employee, or that of other employees working with her, cannot be compromised by appointing the female employee in a job, or requiring her to conduct tasks for which she is not medically fit, or for which she does not have the physical or functional capabilities.

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