Personal Protective Equipment for Women in Mining

All you need to know about PPE for women in the mining sector

Zero Harm to Mine Workers and Communities Affected by Mining Activities

MHSC

Mine Health and Safety Council

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INTRODUCTION

In South Africa, the mining industry is male-dominant and involves hazardous, labour-intensive work. Many aspects of the work environment offer little or no gender-appropriate modifications. There is no off the shelf Personal Protective Equipment (PPE) available for female workers, normally male PPE is used for them, which is invariably too big and ill fitting.

The current PPE does not ensure proper comfort nor maximum protection from mining hazards. In many instances (e.g. when required to perform manual material handling) these differences impact on womens' capacity to perform manual work and discharge their duties.

This illustrative guide is meant to equip mining houses, Women in Mining (WIM) groups, stakeholders, PPE manufacturers etc. with full knowledge about requirements of PPE for WIM.

ABBREVIATIONS

BBSEE	Broad-Base Socio-Economic Empowerment
DMR	Department of Mineral Resources
EN	European Standard
ILO	International Labour Organisation
MHSC	Mine Health and Safety Council
MPRDA	Mineral and Petroleum Resources Development Amendment
NFPA	National Fire Protection Association
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PVC	PolyVinyl Chloride
SABS	South African Bureau of Standards
SANS	South African National Standards
TB	Tuberculosis
WHO	World Health Organisation
WIM	Women in Mining

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UNIT 1 – WIM AND PPE

Learning outcome

The objective of this Unit is to:

- Provide the context of WIM
- Sketch the problems regarding current PPE
- Highlight the legislative requirements for protecting the health and safety of female employees
- Indicate the need for PPE designed for WIM

Introduction

In the past, the South African mining industry was largely male dominant, however with the new gender specific legislation, women are now encouraged to play meaningful roles. Previously women used to occupy 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 in the sector has increased, as it needs to meet the 10% female employment quota that was stipulated by the Mining Charter.[1]

Is there anything that says that the mines should include women in core mining activities?

Yes! Mining legislation has been put in place to make sure that women can be included in core mining activities.

For a woman to be involved in a core mining activity, it means that she holds a position that is equal to a man's within the mine. This can include surface and underground positions, in areas such as metallurgy, mining, engineering and geology.

Key Point

The South African government believes that women should be afforded opportunities in the industry, which is the lifeblood of our land.

1 http://www.miningweekly.com/article/exploring-the-leadership-role-of-women-in-the-mining-industry-2013-08-02 14/04

Key Point

Legislation includes:

- Broad-Based Socio-Economic Empowerment charter (BBSEE)
- Mineral and Petroleum Resources Development Act (MPRDA)
- Employment Equity Act (EEA)

Explanation

What is legislation?

Legislation refers to a law that has been put in place, by a governing body, which can regulate, award, sanction, announce or even limit.[2]

Broad overview of the current PPE problem

As the involvement of women working in these previously male-dominant positions is a relatively new occurrence, it has been identified that the current PPE is restricting their productivity and comfort.

Key Point

Why?

The reason being, women are wearing PPE that is designed to fit the male physique.

A woman working in baggy, loose or sometimes tight fitting overalls, is both uncomfortable and a safety hazard, possibly resulting in serious injuries and accidents. With the recent increase of WIM employment and participation being relatively new, no holistic PPE has been designed to fit women comfortably.

It is important to note that some mines are currently piloting projects where limited manufacturing for woman PPE is being implemented.

Key Point

Women have specific health and safety needs that need to be taken into account when designing and specifying PPE.

Men and women's physiological and anatomical needs are different, therefore PPE needs to be addressed and catered for both.

2 www.londoneventstoolkit.co.uk

By producing comfortable and well-fitting PPE, women will be able to move freely and have a higher degree of flexibility. Women will be more confident in their working environment, thus optimising their performance.

Oversized and tight fitting overalls

Well fitting overall allowing flexibility and mobility

Without proper PPE for women, they are more likely to be exposed to health and safety risks i.e. chaffing, menstruation accidents etc.– which could result in production being haltered.

Therefore, proper PPE is considered to be the most immediate method of preventing health and safety risks from occurring.

When providing PPE for women, there are certain aspects that need to be kept in mind.

These include:

- **Pregnancy**
- **Comfort**
- **Size - need to be available in various sizes, so that women are able to choose the most comfortable fit**
- **Variety of PPE - with respect to the different environments that women work in**
- **Health and safety requirements**
- **Anatomical needs**

Key Point

The biggest challenge that mines face is trying to interpret the current Mine Health and Safety Act (MHSA). This does not guide them specifically as to what the specifications for women PPE are. However, there is adequate information for general PPE.

What does the current legislation say?

The MHSA, No. 29 of 1996, highlights:

- That the mine is responsible for the health and safety of all employees on their premises[3]
- That the mine is responsible for providing an effective method of observing the health and safety environment for their employees
- That the mine has to supply their employees with training and information to avoid health and safety risks from occurring
- That the mine is responsible for providing its employees with sufficient health and safety approved equipment[4]
- That employees are also not permitted to pay for the safety measures that the employer needs to take to insure that their employees are safe[5]
- That the mine has to prevent fatalities, injuries or ill health to any of their employees or members of the public (who have been authorised to visit the mine), and to limit damage to the environment that the mine could inflict[6]

Explanation

3 Mine Health and Safety Act, No 29 of 1996. Refer to section 1a
4 Mine Health and Safety Act, No 29 of 1996. Refer to section 1(a), (e), (h) and section 7
5 Mine Health and Safety Act, No 29 of 1996. Refer to section 24
6 The Safety and Health in Mines Convention C176 of 1995, which was confirmed by South African on the 9th June 2009

The MHSA is in place for South African miners to ensure their protection while working on the mines. There are also international committees who further define the aims of occupational health, such as the International Labour Organisation (ILO) and the World Health Organisation (WHO).

Sometimes mining operations continue to be biased towards the employment of men as opposed to women. This can create more challenges for women attempting to enter this space.

Given that mining is one of the important drivers of the country's economy, the inclusion of women in this crucial sector has many implications for the industry key stakeholders and the society at large.

The classification of women as vulnerable workers with special occupational health needs (different from their male counterparts), by the ILO, places an emphasis in looking at how mining companies can intervene to assist women in performing their duties safely and efficiently.

The International Labour Organisation (ILO) and the World Health Organisation (WHO) define the aims of occupational health as:

- Encouraging and upholding a high standard of physical, mental and social security for all employees
- Placing an employee where they are the most physically and mentally accustomed to the environment
- Preventing ill health due to hazardous working conditions
- Supplying protection to employees to prevent health risks that could occur from working in the mine

Key Point

Are women vulnerable as workers in mines?

According to the ILO, women are classified as vulnerable workers because they have special health and safety requirements.

Due to these requirements mines need to address women's health issues specifically.

Mines need to keep in mind that protective clothing needs to be made available to fit women with different shapes and sizes.

UNIT 2 – AIM OF PPE

Learning outcome

The objective of this Unit is to:

- Define PPE
- Provide the basic requirements for PPE to provide effective protection
- Emphasise the duty of the employer
- Indicate the relevant standards of PPE
- List the effects of ill–fitting PPE

Explanation

What is PPE and why do women in the South African mining industry need it?

PPE stands for Personal Protective Equipment. This special clothing and equipment protects the body from injury and disease by creating a barrier between the worker and the specific health and safety risks she faces in the workplace.

Basic requirements:

Which PPE should workers be wearing to protect themselves?

The right choice of PPE varies from worker to worker and depends on the particular risk she would face while working. The employer can choose the items needed from a wide variety of products, such as **safety gloves, safety glasses, safety shoes, ear plugs or ear muffs, hard hats, self-contained self-rescuers dust masks, harnesses, overalls and reflective vests. Even barrier creams and hair nets can be PPE!**

For example, if someone works in a very noisy environment, she will need PPE to protect her hearing from being damaged. Or, if the working area is very dusty, she will need a dust mask.

Duty of the employer:
The law says so!

As indicated in the previous Unit, the MHSA has been put in place to ensure that workers are provided with the protection they need to keep them from harm while they carry out their work. In addition to applying many other rules that ensure the safety of all mine workers, it holds the employer personally responsible for providing each worker with the right kind of PPE.

This means that the employer must understand the type of work each woman is involved in and the potential hazards the environment holds for each position. Only once all the possible dangers are known, can the correct set of PPE be decided on.

Key Point

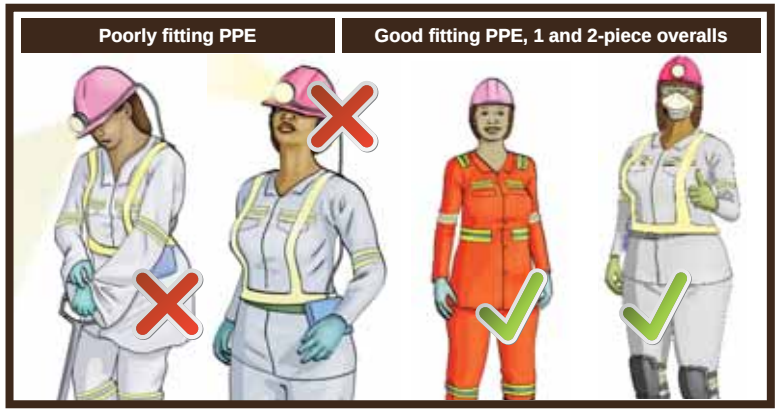
Making sure all mine workers wear PPE on the job is one of the many ways the mining industry is trying to achieve Zero Harm – no injuries, heath risks or fatalities.

Benefitting from the use of PPE takes much more than just putting it on at the start of the work shift. Firstly, the employer must make sure that each woman is well trained in how to use the set of PPE she has been given. Training will teach her why she needs to wear these items, how to use them effectively and how to look after them properly, so that they always provide the best possible protection.

It is also very important that the PPE given to each individual fits properly and is comfortable to wear throughout a work shift. Since the PPE is the last protection barrier between the employee and their work, by insuring the correct PPE is used, health and safety risks will be reduced.

Key Point

Each woman's PPE must be regularly inspected to make sure it is in good working order and will continue to protect her in the way it was designed to do.



Inspection includes cleaning, repairs and proper storage, according to the instructions of the company that manufactured the item. By conducting surveys and gathering data on the physical sizes of the working woman, and taking into account their different working environments, effective PPE can be customised.

Standards of PPE (quality assurance)

It is very important that the PPE provided to women in the workplace meets a high standard of quality. Workers depend on this equipment to protect them in dangerous work environments. **Employers must never compromise quality for a low price.**

Key Point

Employers of women in mining should understand that if PPE fits properly, productivity in all likelihood will increase.

The South African Bureau of Standards (SABS) is a statutory body that promotes and maintains South African National Standards (SANS). The SABS has created individual quality standards for various types of PPE to ensure that the PPE provided by the employer is of a sufficiently high quality and gives the proper protection at all times.

South African standards are in line with best practice in other parts of the world, such as the international ISO standards, Europe's EN standards and the National Fire Protection Association (NFPA), the world's leading advocate of fire prevention and an authoritative source on public safety.

SANS standard	SABS standard	International standard	Type of PPE
SANS 1404:2009		EN 166	Eye & face protection
SANS 20345:2003		EN 20345	Foot protection
SANS 1397			Head protection
SANS 434:2008			Body protection
SANS 50325-1-2-3	SABS 52352-1-2-3	EN 352-2	Hearing protection
SANS 275		EN 149; ISO 1006:2003	Breathing protection
SANS 50471		EN 471:2003	Reflective clothing
SANS 61482-1-1		EN 470; EN 531; NFPA 70E; NFPA 1975; NFPA 1977; NFPA 2112; OSHA 1910.259	Live work
SANS Women Work Wear		SANS 511:2011	Women's work wear

Explanation

What happens when PPE doesn't fit properly?

With PPE, there is no such thing as "one size fits all". When women in the mining industry are given PPE that does not fit them properly, they do not receive the level of protection needed against work–related hazards. Feeling uncomfortable throughout a work shift because of PPE that is ill–fitting, ineffective or too heavy to carry around, can also reduce the worker's concentration, lower the standard of work performance and decrease productivity.

Key Point

Poor fitting PPE is also dangerous. Here are some examples of this important fact:

Effects of ill-fitting PPE

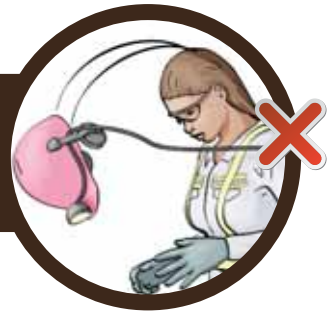
Badly fitting goggles that allow dust and debris to pass between the gaps and irritate or damage the eyes.

Boots that slip around on the foot, causing blisters and general discomfort, taking the worker's focus off the job in hand.

Boots that are too narrow around the calf could cause irritating movement, the boot could even slip off. Socks that are too tight will be uncomfortable to wear for long periods of time.

Gloves that move around on the hands and 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.

Hard hats that are too big and keep falling off, distracting the worker from her tasks and exposing her head to injury.

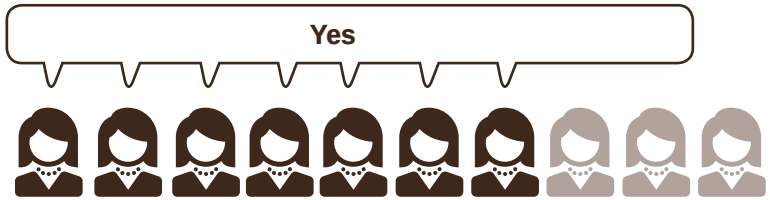


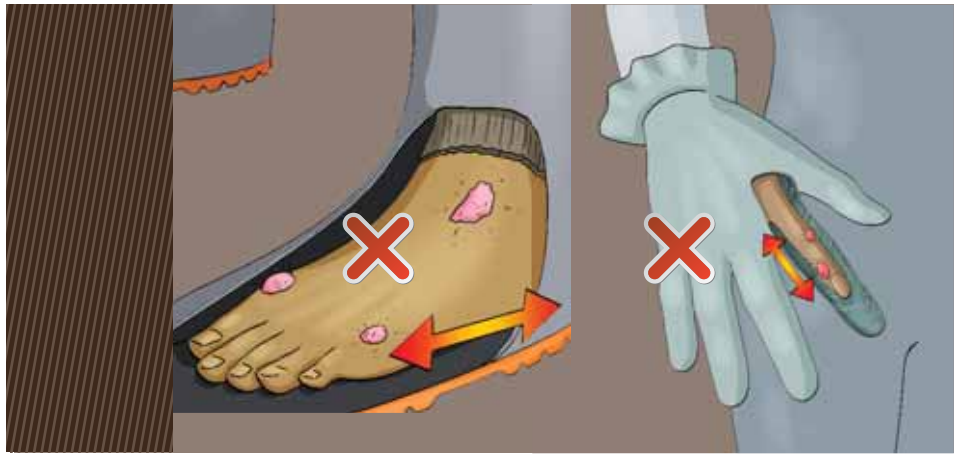
Incorrectly fitted ear muffs and ear plugs that allow noise to come through.

Ear muffs that do not clip to the helmets causing them to fit incorrectly therefore allowing dust and noise to enter the ear and possibly cause damage.

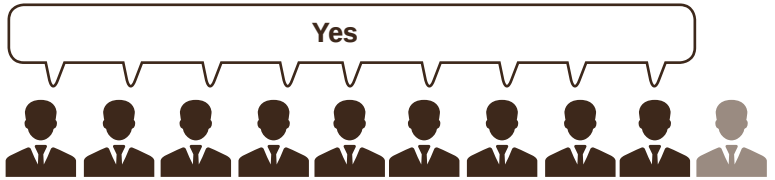
Overalls that are too big, requiring women to roll up the sleeves. This extra material could come undone during work tasks and get caught up in machinery.

A research survey was done with women who work in the mines, to which the findings were insightful. When asked, “Do you think the provision of Personal Protective Clothing which cannot accommodate the unique body structure of a women is a violation to the company Safety standards?” A total of 70% of women answered yes[7].





Furthermore, safety representatives were asked, “Do you think failure to provide adequate WIM Personal Protective Clothing is a violation to the companies Safety standard?” 89% of the representatives agreed by answering / stating yes. By not providing the correct PPE to women their safety is at risk.



[7] WIM Personal Protective Equipment survey, February 2015-North West Province

If PPE is too uncomfortable for women workers to wear, the risk is that they may simply take off the protective items to get some relief so as to focus on the job in hand, exposing them to many different job-related hazards.

UNIT 3 – PPE PROGRAMME FOR WIM, HAZARD AND RISK ASSESSMENT

Learning outcome

The objective of this Unit is to:

- Emphasise the need for a PPE programme
- Indicate the requirements for an effective PPE programme
- Indicate the importance of a hazard and risk assessment
- List hazards and types of PPE protection required
- Highlight the need for a risk assessment process for PPE

Explanation

Are PPE programmes important?
Yes, mines should invest in their own PPE induction course or programme. PPE programmes should aim to encourage the women workforce to wear the PPE that suits their working environment correctly.

Key Point

An induction course or programme of PPE should be made readily available for newly employed women.

This should be part of the greater induction process, while an annual PPE course should be held for everyone including the women employees, just to refresh on the PPE that is available or any concerns that they have.

By introducing PPE programmes, mines can bring awareness and education to the women who require it. This is critical in terms of overhauling safety, as well as identifying any potential creativity there could be in the design of women's PPE.

It is important to provide the workforce with enough knowledge and capacity on how to manage and maintain the equipment, this will ensure that the PPE will last longer and will be taken care of.

Furthermore, by educating the workforce, mines empower them with knowledge and understanding on how to get the most out of the equipment.

What allows for an effective PPE programme?

Key Point

When compiling a PPE programme there are specific aspects that need to be taken into account, these include:

- Hazard and risk assessment
- Recommended PPE for women in mining
- Creating awareness among women in mining
- Sanitary amenities
- Type of mine (process plant, smelter, open cast, underground etc.)

Explanation

Is it important to do a hazard and risk assessment?
Of course! Mines have a responsibility to their workforce, so key risks need to be identified.

For PPE to provide the level of protection that is required, mines need to bear in mind that the PPE should be:

- Suitable for the job (suitable to protect WIM from hazards)
- Worn, used and maintained efficiently by the user
- Comfortable and of the right fit

By conducting a PPE assessment, you will be able to identify gender specific risk areas. However, the industry needs to remember that the effectiveness of PPE is impacted by the level of protection, the conformity with body measures of each employee and job requirements within their working environment.

Hazard and risk assessments need to be processed on every type of PPE, and all the mining environments need to be considered, like opencast, underground, process plants etc.

Head Protection Hazards and Risks

Generally, all mine workers need to wear head protection at all times, by simply ensuring that the workforce wear safety helmets or bump caps, safety standards will improve.

- Helmets are adjustable to accommodate any head size, women need to ensure that their helmets are adjusted to fit properly.

It is advisable to use hair nets for women to protect their long hair styles.

Why hair nets?

Key Point

Women should be required to wear hair nets to prevent their hair from being caught in machinery

If we truly value women's presence on the mine, we should allow them to keep their femininity, by having long hair if they desire. But, we also want to ensure that long hair in a working environment does not endanger them.

Hair entanglement

Face and Eye Protection Hazards and Risks

When looking at face and eye protection, we need to consider all the hazards that may exist on the mine in question, as well as injuries and discomfort that can be caused if appropriate PPE is not used.

To protect the face from the effects of chemical splashes, dust, gases, projectiles i.e. flying fragments or chips, face and eye protection is needed.

By ensuring that at least one of the face and eye protection PPE is worn, serious injuries can easily be avoided.

Hearing Hazards and Risks

Mines do encourage the use of ear plugs, for all miners. By not wearing ear protection, miners can suffer from 'noise – induced hearing loss'. This is the gradual decrease in their hearing ability.

How can we prevent this?

This can be prevented by simply wearing ear muffs or ear plugs correctly[8]. Ear muffs are designed for ear protection that factors in comfort.

Ear plugs worn correctly

Ear muffs worn correctly

[8] http://www.msha.gov/S&HINFO/NoiseToolBoxes/Wear%20Your%20Hearing%20Protection.pps

Hands / Arm Protection Hazards and Risks

When working in the mine the female workforce will require 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
- Dangerous chemicals
- Electric shocks
- Vibrations that can occur in your hands and arms due to equipment
- Cuts and abrasions – which can lead to skin infections, diseases and contamination

Respiratory Protection Hazards and Risks

By not wearing respiratory protective gear, a female worker could expose herself to hazards such as:

- Dust – coal dust and crystalline silica
- Gases and vapour – which may create oxygen deficient environments
- Welding fumes

Key Point

Respiratory protection needs to be considered especially in high risk mines, such as coal, gold, asbestos and in occupations that work with dangerous chemicals and fumes. Respiratory PPE should be used to protect the lungs every single day.

There are several dangerous illnesses that male and female workers may contract if they do not use the correct protective gear. Over time these hazards may progress into serious illnesses such as:

- Pneumoconiosis
- Chronic obstructive pulmonary disease
- Silicosis
- Tuberculosis (TB)
- Asbestosis

By integrating respiratory PPE into the mining environment these illnesses will be less frequent, especially if the workforce are vigilant and use the PPE religiously. The PPE that will assist in preventing these illnesses from occurring is a disposable filtering face piece.

Body Protection Hazards and Risks

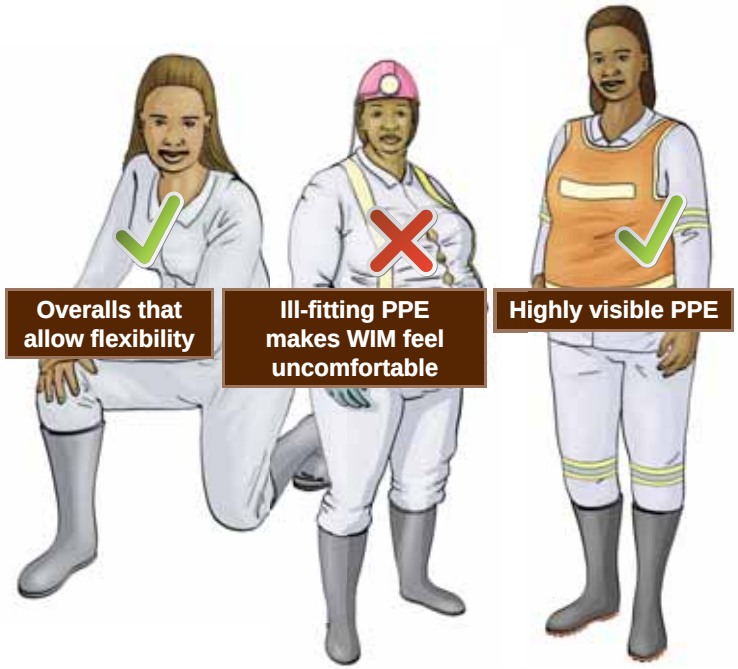
Body protection is another essential form of protection for WIM.

Why?

By introducing an effective overall that will fit a woman's physique, she will feel more comfortable in her working environment.

When assessing the suitability of women's PPE, we should consider the following:

- Replacing overalls regularly
- Boiler suits
- Robust clothing that can combat the conditions
- Clothing that will protect the user against machinery and equipment
- Overalls that accommodate the female physique
- Harnesses / life jackets (for flooding in the mines)
- Overalls that allow for flexibility
- Highly visible work wear



By implementing suitable and effective overalls, the following hazards could be reduced:

- Chemical and metal fragments penetrating clothing
- Spray from spray guns or high pressure leaks affecting the penetration of the overalls
- Entanglement of clothing that the worker is wearing

Foot and Leg Protection Hazards and Risks

Without effective foot protection, workers can:

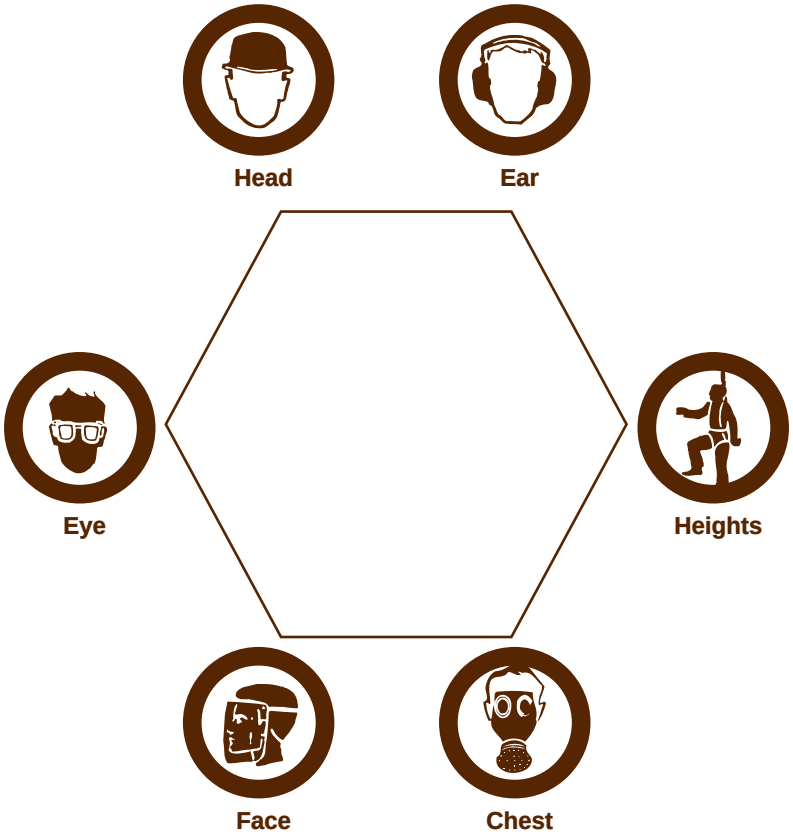
- Slip and fall on wet surfaces
- Have an electrostatic build-up
- Suffer from cuts, abrasions and perforations
- Burns from sparks or flames

If foot and leg protection is not prescribed correctly, it can lead to a number of health risks.

Follow a 6 point check to avoid unnecessary risks and / or injuries

1. Head
2. Hearing
3. Breathing
4. Eye protection
5. Face protection
6. Safety belts and harnesses

So remember the 6 point check

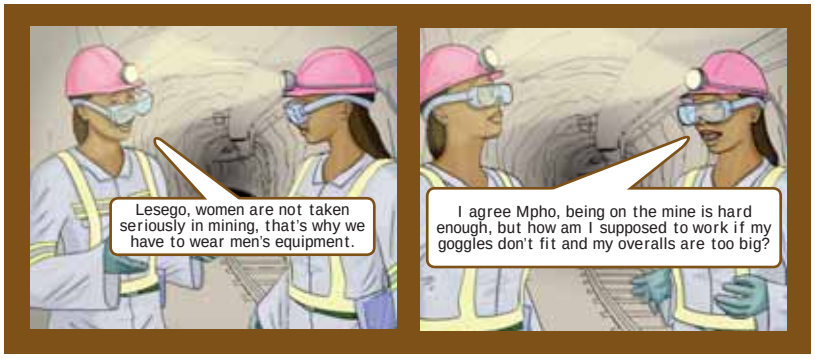


UNIT 4 – THE CURRENT PPE FOR WIM AND THE DEFICIENCIES

Learning outcome

The objective of this Unit is to:

- Indicate the current PPE deficiencies
- How can we improve standards in women's PPE



When it comes to women PPE, there are deficiencies in what is commonly available for women.

Key Point

As previously stated, the Mining Charter states that 10% of a mine's workforce needs to be women, thus creating a need to provide PPE that is designed to fit the female physique.

We want our women to feel more confident by experiencing more comfort and security in the mining environment.

However, this cannot be achieved with all the deficiencies that the current PPE has.

Head Protection Deficiencies

The current head protection in the mining sector is a hard hat or a helmet, and for underground workers there is a hard hat with a lamp – which is clipped onto the front of the helmet.

Although, the current selection of hard hats allow for strong protection against serious injury, in many instances women find the hard hats to be either too big where the hat slips and falls off, too small to accommodate their hair, or too cumbersome due to the battery needed for the lamp.

Too large and heavy hats are not safe for WIM

Why do women loosen their helmet straps?
Women loosen the strap to make space for their hair. The straps need to be used religiously to ensure that the helmet has a snug fit.

By loosening the strap too much, the head protection decreases. Loose hair can cause serious harm, if hair entangles in machinery resulting in downtime of the machinery and injury.

If the hat is not adjusted properly, it will move about, thus diminishing the amount of protection and comfort it provides, and increasing the chaffing against the head area and temple.

Face and Eye Protection Deficiencies

Key Point

Face and eye protection is vital against hazards. If correctly fitted face and eye PPE is specified, face and eye injuries should diminish.

Why is that?
It's simply because the current safety goggles are designed to fit the male face, which is different to females.

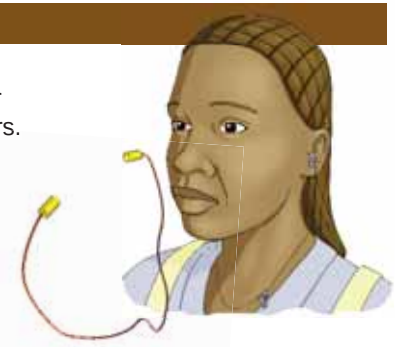
By correcting this deficiency and allowing for a better fit, goggles are less likely to slip which will prevent dust particles going inside the goggles and aggravating the eyes.

The illustration on the right shows dust particles entering badly fitted goggles which renders the safety glasses ineffective.

Hearing Deficiencies

The current PPE for the protection against hearing deficiencies are ear plugs or ear muffs and noise clippers.

However, we should be clear that these items do not block out noise totally, so as to be able to hear one another when talking.



Current PPE available

Ear plugs	Ear plug with clip (noise clippers)	Ear muffs

Deficiencies that occur with ear plugs include:

- Ill fitting ear plugs may well cause discomfort and possibly infection
- Some women's ear canals are generally smaller, thus the specified uni-sized ear plugs are sometimes too big, unless noise clippers are used

Hands / Arm Protection Deficiencies

The deficiencies that are identified with hand and arm protection need to be highlighted, as miners use their hands and arms to complete their work. It is common practice for women to avoid wearing hand protection because the current PPE is uncomfortable. The current PPE that is being used are arm guards and safety gloves. Arm guards are worn by women working underground where the miner has to travel in or go through tight or small (confined) spaces.

Gloves

The safety gloves are used to lift or move mining equipment that is often dirty, hot or covered in hazardous substances. The current safety gloves provided to women are designed to fit a man's hand.

Off the shelf safety gloves generally have very hard inners and are too big and uncomfortable. This can make discharging of duties difficult, because generally gloves are too big, dirt, sweat, water and other materials can easily penetrate them.

Some women on the mine have also reported that their current gloves give them calluses, these open sores can be infected if exposed to harmful substances. They also prevent women from obtaining a firm grip on equipment.

Respiratory (Lungs and Breasts) Protection Deficiencies

Occupational health impacts in mining are not immediate and are therefore difficult to quantify, such as Silicosis - due to excessive dust exposure, remains a major cause of premature retirement and death in South African mines.

Key Point

Depending on the environment, in certain areas of the mine, facial protection is needed as dust particles and gases can easily enter the body through the nose and mouth – leading to increased respiratory problems.

Dust masks, which is the current PPE, allows for protection. However, the mask may also create a feeling of suffocation. A survey was conducted in February 2015 in which women in mining were asked what protection was provided for their lungs and breasts[9].

The findings stated that few mines use dust masks, and even fewer use respirators. However, the shocking thing was that no protection for women's breasts was provided.

[9] WIM Personal Protective Equipment survey, February 2015-North West Province

Body Protection Deficiencies

Current PPE that women wear include 1-piece or 2-piece overalls and reflective safety vests which is of utter importance due to the darkness of many of the mines. Miners need to see each other to prevent accidents. When addressing the deficiencies within the overall, we need to remember that mines offer a 1-piece or a 2-piece, while few mines offer both.

It is critical when making a decision on a 1 or 2-piece overall. Factors like environment, heat, space (for flexibility), comfort, dampness etc. are considered. Looking at the 1-piece overall, women believe that they feel degraded when they have to go to the bathroom and undo the entire piece.

Why?
When a woman is wearing a 1-piece overall she finds that it restricts her movement.

It also affects her when she needs to go to the bathroom, where she finds herself having to completely undress. This can create greater problems, especially with abuse of women underground being so high.

In most cases, women prefer a 2-piece overall as they feel dignified when going to the bathroom. However, this isn't without saying that the 2-piece overall doesn't have problems.

When investigating the current 2-piece suit top, it has been identified to be either too small or too big to accommodate the size of their chests and breasts – therefore making the overall uncomfortable to wear. The size of the top can impact on health and safety standards as being too big can cause serious accidents and injuries.

A lot of women miners have found that there is not a wide selection of sizes for the 2-piece suit pants. The pants are often too big, this results in women having to make use of belts to hold them up – which can again impact on their health and safety. Or the pants are too small, exposing their lower back. Thus, exposing their skin to unpredictable and hazardous environments.

Women also find that when they wash their pants the material shrinks and becomes too tight for the hips, buttocks and thighs. This can cause chaffing. Chaffing is a problem with a lot of women, and can worsen due to exposure to hazardous materials.

Key Point

Please keep in mind that section 6 of the Mine Health and Safety Act (MHSA) states the following:
"The employer must ensure adequate supply of all necessary health and safety equipment for each employee at no cost to the employee" [10]

We now need to consider how we can best adapt this to the female shape. Women's bodily functions also create a need for the colour of the PPE to be looked at. Due to their monthly menstruation, women may prefer their overalls, especially the trouser to be a darker colour.

Key Point

Full body harnesses and thermal suits are hardly used in the mine. This needs to be addressed i.e. if a woman is working in a harmful environment, for example with chemicals, she needs DS9 heat and acid protection.

[10] http://www.workinfo.com/minehealthsafety2008.htm

Foot and Leg Protection Deficiencies

The current PPE is currently not suitable for WIM as they do not fit correctly i.e. often too loose or too big, as women are often wearing men's sizes. Current PPE that the mines use are a mixture of gumboots, safety shoes and knee guards, although SABS (SANS) approved, the current gumboot deficiencies impact women's health, performance, productivity and safety, due to the boots being made for men and therefore, the incorrect size and fit.

In some mines women are wearing male boots, which often results in the boots being too big, which can cause blisters and sore feet.

To compensate, women wear thick wool or cotton socks to try and prevent pain from occurring in their feet.

Often women's feet swell from being too hot, during menstruation, or when pregnant. When the feet and ankles swell the boot or shoe becomes unbearable. Wool or cotton socks are at a shortage in the mines.

Why?
Socks are sometimes not provided by the mine. According to section 6 of the MHSA, all mines need to provide all required PPE to their employees.

UNIT 5– RECOMMENDED PPE FOR WIM

Learning outcome

The objective of this Unit is to:
Make recommendations regarding PPE designed for WIM

Recommendations for WIM PPE

Compliance and implementation of the recommended PPE will greatly assist in the improvement of women's performance in the sector, positively impacting the health and safety standards. The ultimate aim of WIM PPE is to have an optimistic influence towards women's wellbeing, the consequence of this will greatly assist the mines in terms of them complying with the Mining Charter.

Currently there are no recognised recommendations for WIM PPE. However, recently, some mines who are mindful of the Mining Charter have researched and invested in PPE to assist their female workforce. These mines have made a commitment to equality and will hopefully reap the benefits with better working relations.

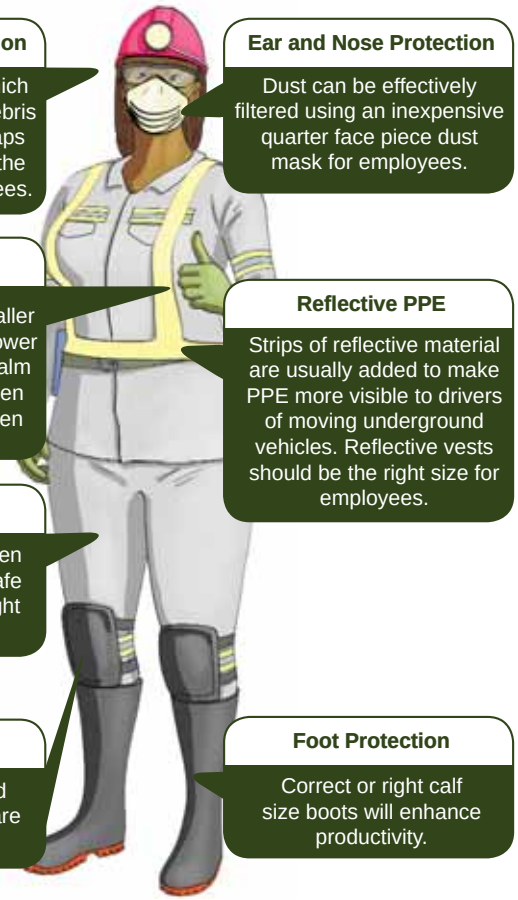
Key Point

When investigating WIM PPE, it is key to remember the different equipment that woman require. They need protection across the board from hard hats to boots. This may vary according to different mining environments.

Overalls **Hard hats** **Reflective vests** **Safety boots**

The Mine Health and Safety Council (MHSC) stakeholders have identified that issues around gender specific PPE need to be addressed[11]

Benefits of proper fitting PPE for women



Eye and Face Protection

Good fitting goggles which do not allow dust and debris to pass between the gaps and irritate or damage the eyes is safe for employees.

Ear and Nose Protection

Dust can be effectively filtered using an inexpensive quarter face piece dust mask for employees.

Hand Protection

Woman's hands are smaller — she has shorter, narrower fingers, and a smaller palm circumference — so even a man's small glove often does not fit.

Reflective PPE

Strips of reflective material are usually added to make PPE more visible to drivers of moving underground vehicles. Reflective vests should be the right size for employees.

Clothing

Overalls which fit women in mining properly is safe as it does not get caught up in machinery.

Knee protection

If crawling in confined spaces, knee guards are recommended.

Foot Protection

Correct or right calf size boots will enhance productivity.

Head Protection Recommendations

Helmets

Protecting women miners from potential head injuries is a key element of safety. A head injury can impair an employee for life and can even be fatal.

[11] Dr. Zungu - South African guideline for the selection and provision of personal protective equipment for women in mining

By providing a good fitting helmet women will feel protected and comfortable therefore eliminating the chance of helmets slipping and resulting in injury.

The table below highlights the recommendations for head protection.

Recommended Protection	Description	Recommended for
	Cap V – guard with fastrac harness setting	General head protection for all employees (mining plant, Engineering, Civil etc.)
	Helmet with fastrac harness setting	Security services, visitors and management
	Uvex Pheos Alpine Helmet (9773.xxx) EN: 397 and EN: 12492	All employees – working at various heights
	Bump cap – Where there may be a risk of a minor bump or scrape to the head	Employees working in workshops. Not permissible in plant area or workshops
	Replacement inner for safety caps (Fastrac type)	All employees
	Protectors cloth sun wide brim – sun master	All employees working long hours in direct sunlight (not mandatory)

Courtesy of Anglo American

Some technical considerations when providing helmets or hard hats for women include:

- Taking into consideration the specifications provided by SANS (1397)
- Proper fit should 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
- A cap lamp that does not impact the weight of the helmet or hard hat
- Always replace the helmet or hard hat if an impact occurs, even if damage is not noticeable
- It is necessary to replace head protection if wear and tear is noticed
- Practical colour selection
- Women are advised to consider their working environment and avoid hairstyles that render their hard hats ineffective.

Hair nets

If we truly value women's presence on the mine, we should allow them to keep their femininity, by having long hair if they desire. But, we also want to ensure that long hair in a working environment does not endanger them.

For women, a hair net is a way to help them protect their long hair. By making use of hair nets they will still be able to have long hair without the fear of it getting entangled in machinery.

Bump caps

Although not suitable for underground, bump caps are another form of head protection that women can wear. They reduce exposure to lacerations and abrasions caused by minor bumps to the head. Bump caps are also well ventilated and are light to wear.

This form of head protection is ideal for women who work on the surface, because the possibility of something falling on their head is less likely than a woman underground.

Face and Eye Protection Recommendations

To protect the face from the effects of chemical splashes, dust, gases, projectiles i.e. flying fragments or chips, face and eye protection is needed.

Types of PPE include:

- Safety glasses
- Spectacles
- Visors
- Face shields

Safety glasses

Visor

Appropriate face and eye protection must be worn at all times in and around the mine, especially where face and eye hazards are prominent. Safety glasses are required when:

- An impact hazard exists
- When working with dust
- Low visibility with a probability of injury because of flying objects

Mines should discourage women from using loose goggles that leave parts of the eye exposed. Promotion of full-time use of goggles or any eye protection in the different working environment should be encouraged.

Some technical considerations when providing face and eye protection for women include:

- Taking into consideration the specifications provided by SANS (1404:2009)
- Provision of side shields and impact lenses on eye protection
- Fit the goggles with an adjustable strap
- Goggles need to be reasonably tight fitting to completely cover and protect the eyes, eye socket and the immediate face surrounding the eye
- Women who require prescription lenses must wear protective devices that are fitted with the lenses, or that fit the protective equipment
- Women who wear prescribed lenses must make sure that they are wearing the correct eye protection when working in a hazardous environment.

- Caution should be used when it comes to prescription glasses, this is to prevent damage to the eye if an impact is to occur
- Eye ventilation should be adequate, but protected enough to prevent splashed liquids entering the eye
- Mines should provide disinfectant if eye protection is shared, this can include eye drops
- Ensure that eye wear provide unrestricted vision and movement
- Ensure that eye wear is durable and cleanable

Hearing Recommendations

Ear plugs are ideal for women.

Why?
Ear plugs can be worn to close the ear canal; ear muffs cover the whole ear and impact the head protection that women wear if not designed correctly.

Both ear plugs and ear muffs may be used as forms of ear protection. It should be noted that the use of ear plugs and ear muffs is dependant on the environment in which the worker is exposed to, this must be considered when specifying.

Ear muffs generally allow for more comfort and are normally worn for long periods of time.

Ear plugs are convenient to carry around and in most instances provide better noise protection.

Some technical considerations that the mine needs to look into with hearing protection are:

- Specifications provided by SANS (1451-1) for ear muffs
- Specifications provided by SANS (1451-2) for ear plugs
- Perform ear screening regularly – to test for ear infections
- Remember that when a female worker has an ear infection the mine must provide them with ear muffs to prevent the spread of the infection
- Ear plugs made from waxed cotton, foam, silicone rubber or fibreglass wool will form to the individuals ear canal, and work just as well as most moulded ear plugs
- 100% PVC free, soft slow recovery foam, is a better option
- Reusable ear plugs should be cleaned properly with disinfectant at the end of every shift
- Educate women on the importance of disinfecting ear plugs regularly

Key Point

It is important to keep in mind which form of ear protection will fit better in a particular mining environment.

Hands / Arm Protection Recommendations

It is vital that gloves are selected for specific tasks, and that their durability is established. By identifying which type of glove is suitable to the mining environment, miners will be able to put on their gloves comfortably, and proceed to work in an efficient manner.

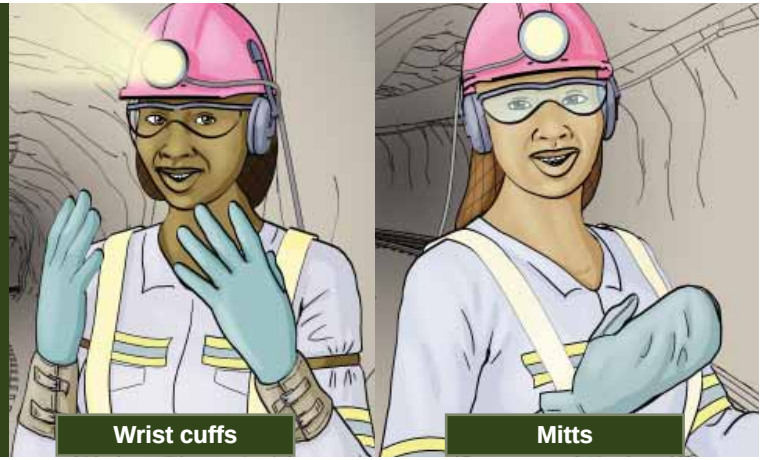
Women need their own gloves, as men's gloves are generally too big and cumbersome for them to work efficiently. Gloves that are too big can result in serious accidents or injury.

There are several different types of hand and arm protection that allows mines to identify which PPE will be more effective in a working environment.

However, there are different types of PPE, to prevent such hazards and risks from occurring. These include:

- Gloves
- Gauntlets
- Mitts
- Wrist cuffs
- Armlets
- Barrier creams

By incorporating these types of PPE, the risks will decrease.



Barrier cream is a protective cream ideal for skin in a high risk working environment (such as mining) that may need extra protection. Barrier creams are a water-repellent barrier that protects the skin from external irritants. Characteristics of barrier creams are as follows:

- Water-repellent cream to protect fragile skin
- Free from fragrance and preservatives
- Contains caring oils
- Heat resistant

Protective gloves are suitable for women, but should come in various sizes to accommodate women's hands. These gloves can be used in operations where abrasion resistance is common, i.e. underground. SANS (1228:2009) is specific with what the requirements are with the different type, design, construction, material, dimensions and service - related properties for protective gloves.

In the table below we see the different types of gloves that are currently available.

Recommended Protection	Description	Category	Recommended for	Not recommended for
	Glove Welder 400mm	CE 413 EN 407 Grading 413 x 4 x	Hot work, welding, flame cutting and handling of material	Large quantities of molten material
	Gloves reinforced candy stripe		Light to medium material handling	Welding or small to large quantities of molten material
	Glove Nitrate Green	No CE Grading	Washing with soaps and other domestic cleaning agents	Hot work or handling of hot material Sharp and pointed material and tools Cleaning with aggressive cleaning solvents
	Glove Ultrane Grey Polyamide	CE4121	Handling abrasive material Handling of small components Using portable tools	Hot work or handling of hot material Sharp and pointed material and tools Handling abrasive material Cleaning work with grease and solvents
	Glove pigskin / drivers glove inner for safety caps (Fastrac type)	CE1121	Dusty conditions Operating TMM Climbing stairs	Hot work or handling of hot material Sharp and pointed material and tools Handling abrasive material Cleaning work with grease and solvents

The table above is continued on the next page.

Courtesy of Anglo American

Recommended Protection	Description	Category	Recommended for	Not recommended for
	Whizard hand guard 11a	CE 354x	- Cutting with utility knife	- Hot work or handling of hot material - Pointed material and tools
	Glove Nitrile Green / Yellow	CE grading 4 111	- Dusty conditions - Operating TMM - Climbing stairs	- Hot work or handling of hot material - Sharp and pointed material and tools - Handling abrasive material - Cleaning work with grease and solvents
	Gloves Acid 400mm Chlorinated		- Handling abrasive material	- Hot work or handling of hot material - Sharp and pointed material and tools - Handling abrasive material

To provide well-fitting PPE for women, it is important to look into the following:

- Using cotton, terry cloth or a light weight leather
- Ensure all exposed skin is covered by gloves
- Ensure that the gloves finger length and palm width fit the hand of an average woman
- Make sure the gloves still allow for movement to do skilled working activities
- Ensure gloves have a good grip when working with equipment
- Short gloves should cover long sleeved overalls, to prevent anything from catching on and exposing skin

Respiratory Recommendations

Dust, when inhaled, could cause systemic and lung diseases as well as other respiratory ailments.

Research conducted among WIM in 2012 revealed that dust was indicated as a main concern among the miners. According to the female miners participating in the research, dust affects employees' lungs, eyes and ears.

The female miners felt that the mining company could do more to reduce dust in the working environment. They suggested that dust masks be improved and that water be used to reduce dust in dusty working environments[12].

Examples of the effect of dust are illustrated in the following comments:

"I'm a pecker operator. I'm breaking the rocks with this other machine; I'm just standing there and the machine is operating, but the thing is, it's dusty, you can even smell it, it's not good, especially for my lungs. So if they can improve the dust mask, it will definitely help." Pecker operator (Female – platinum miner).

Body Protection Recommendations

Overalls need to be comfortable and the material needs to be able to 'breathe' so that miners do not dehydrate.

[12] Dr. Zungu - South African guideline for the selection and provision of personal protective equipment for women in mining

Ill-fitting and badly specified garments may cause the female miners to sweat. This in turn makes working uncomfortable as the moisture causes chaffing.

In the table below we see the different types of overalls currently available, all SABS approved 100% cotton J54 / D59.

Recommended Protection	Description	Category	Recommended for	Not recommended for
	Jacket and pants - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Royal blue - Cloth material: J54 - Cloth material: D59	 Light duty application Heavy duty	Engineering and operations personnel Mining	N/A
	Jacket and pants - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Blue c/w - Reflective tape for high visibility - Cloth material: D59	 Heavy duty	Engineering, Women in mining and operations personnel Mining	N/A
	Jacket and pants - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Orange - Reflective tape for high visibility - Cloth material: J54 - Cloth material: D59	 Light duty application Heavy duty	Safety Representatives Mining	N/A
	Jacket and pants - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Grey / Green - Reflective tape for high visibility - Cloth material: J54 - Cloth material: D59	 Light duty application Heavy duty	Engineering and operations personnel Mining	N/A

Recommended Protection	Description	Category	Recommended for	Not recommended for
	Overalls 1 piece - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Royal blue - Reflective tape for high visibility - Cloth material: D59	 Heavy duty	Engineering and operations personnel Mining	N/A
	Overalls 1 piece - Design and cut comply with SANS 511: 2011 - Button / slide fastener - F/Green - Reflective tape for high visibility tape - high visibility at back - Cloth material: J54 - Cloth material: D59	 Light duty application Heavy duty	Welders, boilermakers and plate workers	N/A
	Overall 1 piece - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Reflective tape for high visibility - Grey - Cloth material: J54 - Cloth material: D59	 Light duty application Heavy duty	Learners Engineering and operations Mining	N/A
	Overall 1 piece - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Reflective tape for high visibility - Cloth material: J54 - Cloth material: D59	 Light duty application Heavy duty	Safety Representatives Mining	N/A
	Trousers - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Reflective tape for high visibility - Grey - Cloth material: J54 - Cloth material: D59	 Light duty application Heavy duty	Learners Engineering and operations Mining	N/A

Recommended Protection	Description	Category	Recommended for	Not recommended for
	Dust coat - Design and cut comply with SANS 511: 2011 - Royal blue - Button - Polycotton - Cloth material: J54	Light duty application	Cleaners	N/A
	Jacket and pants tailor made for women. - Design and cut comply with SANS 511: 2011 - Button / slide fastener - Blue - Reflective tape for high visibility - Cloth material: D59	Light duty application Heavy duty	Engineering, Women in mining and operations personnel Mining	N/A

Courtesy of Anglo American

Overalls need to allow for the absorption of moisture, while still providing sufficient protection and comfort. Wearing undergarments is vital while working.

Why?
By wearing proper and well-fitting undergarments including breast protection, it will prevent health problems, such as chaffing, rashes and infections often caused by harsh or cheap fabric rubbing on the skin and inner thigh.

When looking into protective overalls for women, it is suggested that WIM consider items from the following list depending on their job description:

- Boiler suits
- Clothing for cold, heat and bad weather
- Clothing that will protect them against machinery
- High visibility vests or jackets
- Harnesses or life jackets
- Option on 1 and 2 piece suits
- Colour of PPE

Key Point

When looking at overalls it is important to remember size variations and design for WIM PPE.

The main areas that need re-designing for women are the torso length; shoulders; chest – to accommodate breasts; waist and hips. Women generally complain when wearing men's overalls that they are tight in some areas, too loose in other areas and are baggy. This can result in limited movement.

The material for the overalls is just as important for women. The technical considerations for this include:

- The outer material should comply with SANS (1261-2)
- Use of cotton fabric for female workers
- Cotton must be treated, be protected against dust, abrasion, rough and irritating surfaces
- Nylon, polyester, wool, lycra must be avoided
- Use natural fibres for women PPE
- The inner lining of the overall should be an acceptable fusion woven or nonwoven, which is suitable for hand washing
- Buttons should be four-hole dope-dyed plastic, size according to SANS (511:2011)
- Slide fasteners should be one way closed end for all overall pants, as SANS (511:2011)
- Elastic webbing shall be 25mm in width and in line with SANS (411:2011)
- Nomex, Kevlar and PBI can increase body temperature so avoid for women PPE
- Use of light density cotton fabric to allow the overalls to 'breathe'
- Have a variety of fabrics for women, as some may have an allergic reaction

The overall style and variations are also important. Women should be able to choose if they want a 2-piece or a 1-piece overall (however this is also dependant on the working environment).

Both long and short sleeve overalls need to be provided, keeping in mind that miners working underground require long sleeves. When looking into 2-piece overalls, the following points are recommended:

- Shorter torso length
- Narrower shoulders

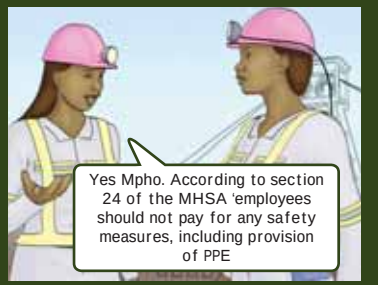
- Bigger chest / breast area
- Smaller waist
- Larger hips

Overall pants and jackets need to be supplied in women sizes, with recommended nominal finished garment measurements. SANS (511:2011) stipulates the measurements for women.

Overall pants should have plain fronts, a ruched back waistband, a slide fastener fly and slanted or straight side pockets as stated in SANS (511:2011). Elastic bands in the pants should be avoided as they can be tight for overweight woman and can easily bunch up. By using darts on either side of the garments it becomes more comfortable for women to wear. SANS (511:2011) stipulates that the overall jacket should be fastened up at the front.

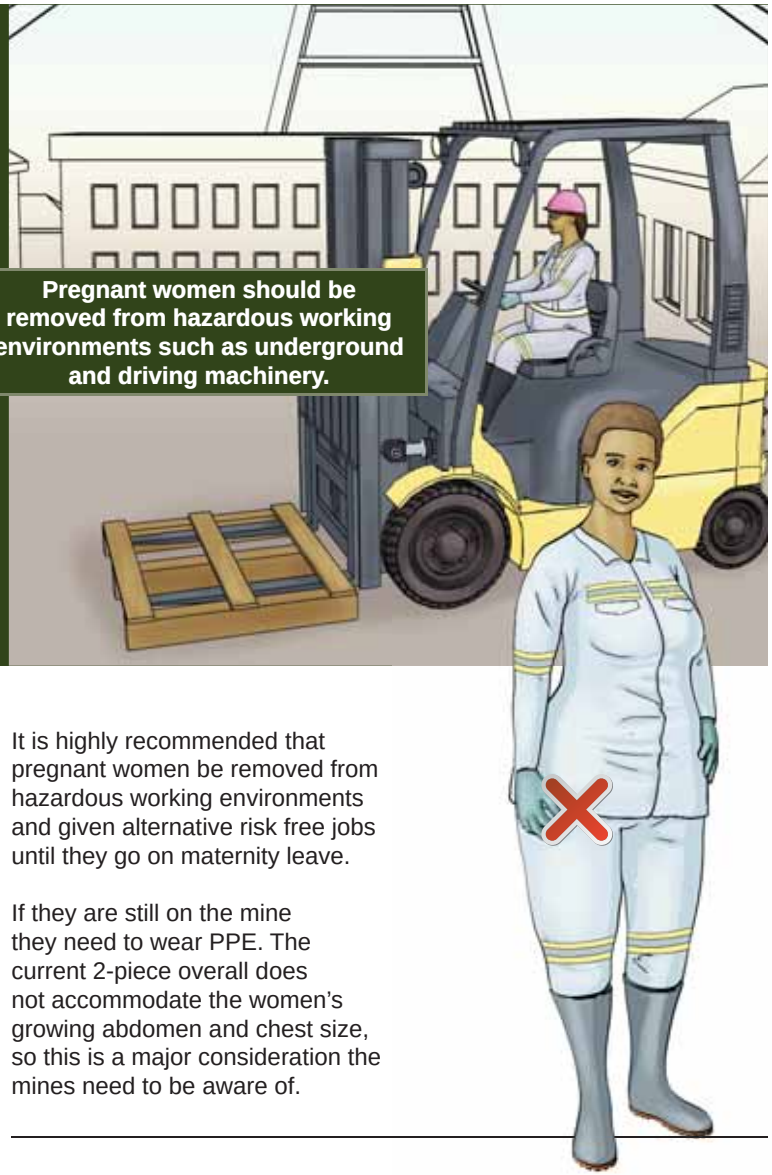
The technical considerations for providing appropriate undergarments for WIM include the following:

- Women experience health problems, such as chaffing and rashes that are caused by the quality of the fabric
- To prevent chaffing women need to wear undergarments. Currently, mines use lycra undergarments – this is a poor choice as it increases the body temperature and can result in vaginal infections
- To combat the risk of chaffing, rashes and infections it is recommended that
  - Cotton undergarments be used
  - Overall lining is in contact with the skin, therefore should be made with 100% cotton and not synthetic materials
  - All undergarments should be cotton, including shorts. Shorts should not have an elastic band



Body Protection for Pregnant women

Maternity PPE is just as important as normal women PPE. Some pregnant women miners often feel more uncomfortable going to work.



It is highly recommended that pregnant women be removed from hazardous working environments and given alternative risk free jobs until they go on maternity leave.

If they are still on the mine they need to wear PPE. The current 2-piece overall does not accommodate the women's growing abdomen and chest size, so this is a major consideration the mines need to be aware of.

Foot and Leg Protection Recommendations

The current boot size for WIM is poor and needs to change. Women cannot be working in men's boots, because of the different hazards and accidents that occur.

The correct use of foot and leg protection includes:

- Women miners should not wear boots that are too tight for them, as this will only cause foot problems
- The boots should come with insoles, which will add another layer of comfort to their feet
- Mines need to make sure that the boots are comfortable and are slightly tight around the heel, ankle and ball of the foot

Not only do accidents and injuries occur, but women often find themselves suffering from blisters, sore feet, calluses and stones in the boots. Therefore, women sized boots need to be implemented.

Gum boots form part of safety footwear and are in place to protect workers against common foot injuries. Women may be protected from static and live electricity, wetness, slipping, heat and sparks.

To do this, the foot protection does require special design. This includes a steeltoe for rubber boots.

The illustrations below show you the different types of shoes that can be used in WIM PPE.

Recommended Protection	Description	Category	Recommended for	Not recommended for
	Shoe leather - Men	Light duty application where toe, sole and ankle protection is required	- Men in office and workshop building - Cleaners	Mining and plant environment
	Shoe leather - Ladies	Light duty application where toe, sole and ankle protection is required	- Ladies in office and workshop building - Cleaners	Mining and plant environment
	Boots leather - Men	Heavy duty application where toe, sole and ankle protection is required	Men in workshop and flat surface environment	Mining and plant environment
	Boots leather	Heat resistant application	Welders and plate workers in workshops, plant and mining applications	N/A
	Boots leather	Heavy duty application where toe, sole and ankle protection is required	- All applications - Compulsory for employees in plant and mining applications	N/A
	Gumboots PVC and rubber	Wet application	Plant and mining activities in wet areas	For operating TMM's

Courtesy of Anglo American

Key Point

It is highly recommended that women need to be provided with safety boots that accommodate their sizes.

Technical specifications for gum boots and safety shoes can include, but are not limited to the following:

- Specifications provided by SANS (4291-1:2002) and SANS (492-2:2003) must be considered
- Provide gum boots / protective shoes that are made from leather
- Discourage women miners from wearing tight boots, which will only increase their foot problems
- Provide inner soles, to add comfort
- Ensure that the boots fit correctly and comfortably
- Ensure that WIM can test boots to see which boot fits correctly

However, if a mine implements correct PPE such as indicated below, these incidents would not occur as:

- Safety boots – with protective toe caps and penetration resistant mid-soles
- Foot guards – which are made from aluminium, fibreglass or galvanised steel and is to be worn OVER usual working shoes[13]
- Gaiters
- Leggings or spats
- Thick socks

Socks will help with excessive sweating of the feet. Thick double socks will be useful, as the inner layer of the gumboots may cause pain. Socks will also help women fit into their boots, even if they are too big. All of the items mentioned do not have a feminine touch. This needs to be addressed when we look at new designs.

Gaiters

Foot guard

Thick 100% cotton socks

Key Point

It is key to remember that when looking into foot protection that pregnant women will also require special boots, because their feet swell.

[13] http://ehs.ucsc.edu/programs/safety-ih/ppe.html

UNIT 6 – MINING FIT – INCREASED AWARENESS FOR WIM (LOOKING AFTER YOUR PPE)

Learning outcome

The objective of this Unit is to:

- **To empower women to know their PPE**
- **Provide recommendations for the maintenance of PPE**

If mines were to enforce the following suggested recommendations and methods, the PPE would last longer. By creating awareness, making recommendations and suggesting methods on how to maintain the equipment, their staff will be educated on how to care for their PPE. Mines can create awareness in many different ways, i.e. quarterly workshops; awareness courses where new employees are inducted; hanging posters in pertinent areas, such as the waiting place or change house.

Head Protection Awareness

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

- Suspension systems are offered as replacement parts and should be replaced when damaged or when 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

- Mines must always replace the helmet if it sustains an impact, even if there is no noticeable mark

The proper fit of a helmet should allow adequate space between the shell and suspension system, this allows for ventilation and distribution of an impact as illustrated on the right.

In order 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
- In the change house and bathrooms, mines should provide special cleaning products to clean the helmet of dust
- Mines should consider implementing storage units, which will encourage women to leave their helmets on site

Face and Eye Protection Awareness

Mines need to ensure that women employees wear eye protection daily. By wearing eye protection one eliminates the risk of damage to the eyes in case of accidents taking place.

The correct use of eye protection is:

- Women should never wear loose goggles, as this exposes certain areas of the eye
- Goggles should be tight, fit the face properly, completely cover the eyes and immediate facial structure
- Encourage and promote the full-time use of goggles
- Promote the eye protection for the various working environments

- Women who need prescribed eye wear, must make use of glasses that already contain their prescription eye wear
- Even if a women wears prescribed eye wear, they still need to wear appropriate eye protection – this will protect the eye from dust and any hazard environment they are exposed to
- Caution should be exercised with the use of both metal frame protective devices and frames of spectacles for women, particularly in electrical hazardous areas of the mines

- Eye protection should be designed and used so that it provides both adequate ventilation and splash protection
- Use disinfectant if the PPE is shared amongst women, and ensure the equipment is cleaned properly (although seldom shared)
- Ensure that the eye wear is not restricted in terms of vision and movement

Maintaining the equipment is easy, as long as the women are taught how to do it correctly. These methods are:

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

Hearing Protection Awareness

Mines need to promote the use of hearing protection and how to maintain this equipment. However, mines cannot promote this unless they 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
- If an employee has an ear infection, provide them with ear muffs instead of ear plugs – this will prevent the spread of the ear infection

It is important to wash hands before using ear plugs

- Encourage women to clean hands before handling the ear plugs, as this is a way to introduce ear infections
- Ensure that the 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
- The use of 100% PVC free soft slow recovery foam will shape itself easily into the ear canal
- If the ear plug is reusable, they should be disinfected 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

Regular hearing checks to be done to maintain hearing.

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 will need to be worn correctly.

This includes:

- Wearing gloves that are designed for a particular task and are durable
- Mines may use coated fabric gloves that are made from cotton flannel with napping on one side
- Ensure that the glove's finger length, width and palm circumference fit the average women's hand
- Gloves need to be comfortable, and not clumsy or awkward to wear
- Gloves must have a safe and secure grip – which will prevent heavy and big tools from slipping out their hands
- Women must put their gloves on correctly. Therefore no gaps or skin to be exposed and no water or material to enter

Hand and arm protection for women PPE is generally inadequate and needs to be adjusted to fit every female miner.

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

- Gloves are treated so they are flame retardant and acid resistant
- Educating women on how to effectively care for the gloves

Respiratory Protection Awareness

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

Entry level protection would be dust masks. These are worn by many miners during their daily activities. In higher risk environments, a more tailored approach must be considered, this would involve evaluating constant dust, gas and chemical exposure.

It is important to educate female miners about respiratory PPE and the dangers associated with not using them or using them incorrectly.

The use of respirators should help reduce chances of major infections. Mines need to make sure that their women workforce are aware of the damages that can be caused by not protecting their lungs.

Dust masks are worn in many South African mines.

A miner wearing a dust mask

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 to first ensure the correct use of body protection i.e.

- By wearing correct fitting overalls, productivity increases
- Overall materials need to 'breath' and be comfortable, this way the body will be able to maintain its internal temperature without 'heat

stress' impacting women's working speed

Foot and Leg Protection Awareness

Before mines can recommend methods on how to maintain the PPE they need to make sure that the equipment is being used correctly.

With all the proper fitting PPE, mines will need to further educate their staff on how to maintain their boots adequately. Methods that allow for boots to be properly maintained include:

- Women's boots should be assessed every three months, so as to combat the deterioration of the insoles of the boot – this obviously depends on the conditions and the environment
- Providing cleaning kits in the change rooms and bathrooms, this will allow for women to clean their boots after their shift if there is no cleaning staff maintaining the PPE
- Mines may want to have an on site storage unit which enforces women to leave their boots on site – this way management can validate if they need new boots or not. Some mines already have these facilities in place

UNIT 7 – SANITARY AMENITIES

Learning outcome

The objective of this Unit is to:

- **Indicate limitations regarding current sanitary amenities**
- **Provide potential recommendations for the improvement of sanitary amenities**

Explanation

What are sanitary amenities?

Sanitary amenities refer to the toilet facilities that workers use underground and on the surface. The condition of the amenities is primarily poor and women often find themselves avoiding going to the bathroom. Mines need to rectify the conditions of the bathrooms and ensure that their safety, health and privacy is upheld and protected.

Explanation

What are the limitations of the current sanitary amenities?

Generally speaking the current sanitary amenities in the mines are unacceptable.

Women either have to walk far or don't have access to a toilet. Therefore the priority should be to make provision for adequate toilet facilities.

Current limitations include:

- None or limited access to underground toilet facilities
- Unhygienic toilet conditions
- Hand washing facilities after using the toilets 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 on the surface
- Incorrectly specified PPE can make it difficult when going to the bathroom
- Inadequate space

Mines need to make provision for acceptable sanitary facilities.

Why?
Women need to have adequate bathroom facilities, especially when they are menstruating. Menstruating is the body's way of cleaning out her reproductive system; essentially it means her body is telling her she is not pregnant.

By implementing sanitary bins in the woman's bathroom, women will feel more comfortable changing their sanitary pads during their mensuration cycles.

A sanitary bin is a special dustpan which allows women to throw away their sanitary towels. By using this bin the health and safety standards are not impacted as women then do not leave there sanitary towels lying around. For any women to prolong the changing of her sanitary towel, leakage may occur. Currently, when women work underground, they choose to dispose off their sanitary towel by either burying or carrying it around with them until they reach the surface. Carrying around a sanitary towel or leaving them on for too long, can drastically impact on health, safety and comfort.

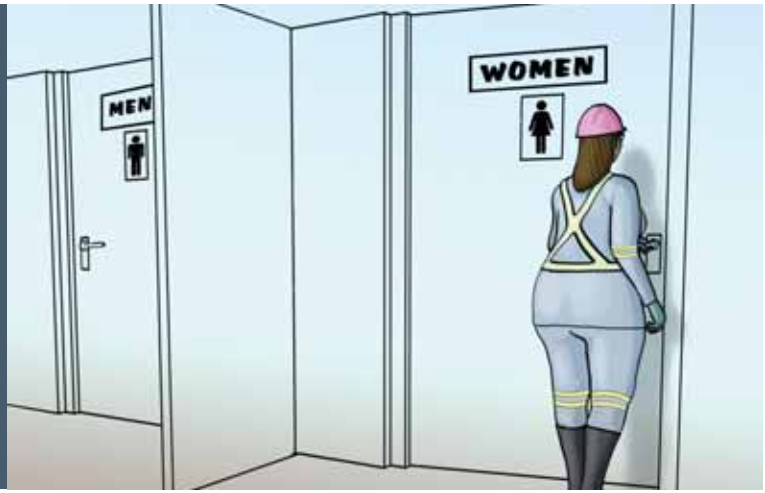
How do we improve on the sanitary amenities?

To prevent the risk of infections, chaffing, further discomfort and loss of productivity, mines need to consider the implementation of:

- Additional toilets per work station – while keeping in mind its 1 toilet for every 30 workers, men and women
- Additional toilets that are not far to reach from working stations
- Mark out which toilets are 'men' and 'women'
- Equip all toilets with toilet paper, hand washing facilities, soap, hand sanitizer and bins
- Allow access to water for hand washing facilities – for hygiene purposes
- Light up the bathroom areas, secure the doors to make the sanitary facilities safe for women

Key Point

The most important thing for mines to do is clearly mark toilets as 'men' and 'women' and then put SHE bins or sanitary bins into the women's bathrooms!



If we look at implementing adequate sanitary amenities, women would feel more comfortable going to the bathroom and will also maintain their privacy, dignity, pride and will have protection from abuse.

When looking into sanitary amenities, we need to consider that women have specific needs. By simply supplying the toilet facilities with what women require, the women workforce will feel more confident working

underground and will help make them feel welcome and part of the team. By providing women with a selection of overalls, they will be able to choose which suits them best in terms of sanitary requirements.

The toilet facilities also need to be cleaned daily and properly.

Key Point

When selecting these items she 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 2-piece overall. If she doesn't need to go as often, a 1-piece will be more suited for her. This also depends on the working environment.

Colour of clothing plays a role. If a woman works underground, giving her a light coloured overall is problematic. Not only because of the dirt, but also because if she is menstruating any stain may be disguised by the dark overalls.

UNIT 8 – MANAGEMENT AND STAKEHOLDER BUY IN

Learning outcome

The objective of this Unit is to:

- **Indicate the need for management and stakeholder endorsement**
- **Provide recommendations to management and stakeholders regarding the introduction of PPE for WIM and PPE programmes**
- **To list factors that need to be considered for an effective WIM PPE programme**
- **Indicate the benefits of PPE designed for WIM to:**
  - **Corporations**
  - **WIM**
  - **Relevant Stakeholders and Beneficiaries**

Endorsement of PPE specifically for women

Management commitment should be noticeable at all levels in the mining sector. Given the fact that mining companies tend to have hierarchical management arrangements, it is essential for the Chief Executive Officer (CEO) to fully invest in a proposed WIM PPE programme, because only then will the promise to make a PPE equality programme a reality, infused through the senior, middle and lower management. It does not only come down to management, to commit to incorporating women. Measuring results, having clear deliverables and stated consequences in the event of a failure to achieve the results should be part of a greater women in mining programme.

Identifying the Drivers for a WIM PPE programme

When implementing a WIM PPE programme, mines need to have identified the drivers of the programme. Common drivers that are identified include:

- Legislative – The South African government mandates that 10% of the workforce needs to be represented by women in the mining sector
- Business case – Mine management should see the potential for women to be an asset, if this is realised then the numbers in the sector could potentially grow, possibly optimising output and productivity

- PPE Policy-companies must develop the WIM policies
- PPE Committee-companies must form PPE Committees that have women representatives
- Corporate social responsibility – by employing women, mines can assist in breaking the cycles of poverty. By contributing to a single parent household welfare and increasing skills of people in the community
- Optimisation of the female workers – better fitting PPE will result in a happier and more productive workforce

Pre-Induction

The objective of a pre-induction process is to ensure that all new female recruits are aware and have a deep understanding of PPE policies and on the job training. The induction is very important, as it is the first point of contact between the new recruits and the mine. Mines therefore can use this opportunity to ensure that all recruits are aware of the variety of cultures, the policies and the processes of the mine.

The induction process

It should be noted that some mines and governing bodies have made notable progress in creating awareness of WIM PPE. By redesigning the PPE to fit the female physique and adjusting change house facilities to keep a woman's dignity and privacy, mines will provide the women with a sense of comfort and security– thus making them feel wanted and part of the team. Additional efforts must be placed to ensure the safety and dignity of women working strenuous shifts in the underground environment.

Pre-induction

Factors to consider with the pre-induction process are as follows:

Establish a standard for WIM PPE

It is recommended that a standard of PPE for WIM be established. By setting criteria for WIM PPE, mines will be able to determine which PPE is required. This to be in the form of an MHSC Online Compendium. The mines Head of Occupational Health and Safety (OHS) should define the minimum requirements for WIM PPE.

Responsibilities

Senior HR and OHS managers are responsible for the development, implementation, and administration of PPE policy for WIM.

Technical governance

Technical governance is a vital component of group governance processes. It is intended to be the cornerstone of achieving leading business performance, by adding value and mitigating risk across the organisation. Set nonnegotiable polices and standards in WIM PPE should be created so that a common and consistent approach is taken.

Technical Standards should define the mining organisation, systems and requirements to support the governance process related to WIM PPE.

Proposed application for mines
The Group Technical Standard should be mandatory and should apply to all managed operations.

Proposed Definitions for a mine
Technical Standards would define minimum requirements to be implemented. They should be driven by risk or value enable governance.

Technical Guidelines for women's PPE: This should expand on requirements sets out, providing more detail including generic documentation, interpretations, examples of leading practice and dealing with implementation aspects, including training.

PPE for WIM: STAKEHOLDER BUY-IN
Incorporating women into the workforce is a theme that is cross-cutting across the sector, the WIM PPE programme requires buy-in from a variety of stakeholders for it to be a success and actually to make a difference.

Before beginning with the design and implementation of a programme, it would be a good idea to bring all the relevant stakeholders together to have a constructive discussion on the motivation. Stakeholders' workshop should include representatives from:

- Human Resources
- Core operations (mining and processing)
- Recruitment
- Communications
- Organisational Development
- Community Development
- Training
- Local community
- Women workers / women in mining groups
- Unions and / or organised labour
- Occupational Health and Safety
- Employee Relations

Buy-in could be achieved by conducting workshops where everyone is allowed to contribute their point of view regarding the programme.

This process, although time consuming and sometimes frustrating, is essential in creating a sense of ownership by each stakeholder, 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 implementation strategy.

Factors to consider during this process should include:

- Women not drinking enough water so that they don't need to urinate often
- Suppressing the urge to urinate
- Not changing sanitary towels regularly
- Not understanding the concept and responsibility of good personal hygiene

Hygiene and toilet facility requirements:

- Available in workplace (underground, pits)
- SHE bins hygienic and regularly emptied
- Well lit and appropriately located - safe to use
- Dedicated female toilets, clearly marked
- Lockable doors on toilets
- Adequate toilet paper and wash basin/water/soap to wash hands

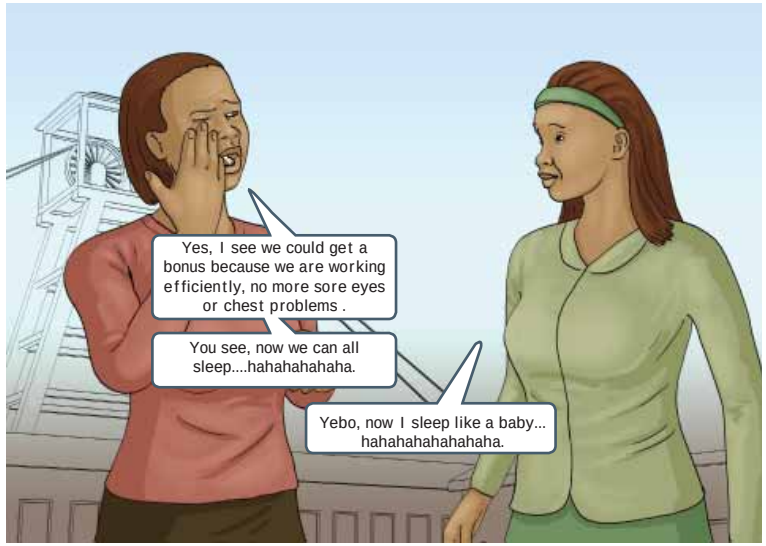
Education and awareness:

- PPE – proper use, care, hygiene, issue, no cost
- Hazards of infection, occupational skin diseases
- Unsafe and unhealthy practices

Things to consider

No.	Initiative	Status
1	Risk assessment to inform selection of PPE	√
2	PPE programmes integral part of occupational health and safety management system	√
3	Policy on PPE for WIM	√
4	PPE educational programme based on policy	√
5	Strategy to consider ergonomics, anthropometric data & comfort in PPE selection/design	√
6	Promotional strategies to promote responsible use and maintenance of PPE	√
7	Involve all stakeholders in design of appropriate PPE for WIM	√
8	Survey on PPE for WIM to identify problem areas	√
9	Involve female PPE users in selection of suitable PPE, including trials	√
10	Consider implementation of SANS 511 for undergarments	√
11	Provide 2 piece overalls of a suitable colour until customised clothing is available	√
12	Suitable female toilet facilities at the workplace (underground and remote surface operations)	√
13	Awareness programmes on risks identified in study	√

With correct PPE for WIM we are all happy as production improves and WIM's health is improved.



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