**COLLIERY TRAINING COLLEGE (PTY) LTD**
*Incorporated in the Republic of South Africa Reg. No. 1965/007106/07*

**MINES RESCUE SERVICES (Pty) Ltd**
INCORPORATED IN THE REPUBLIC OF SOUTH AFRICA - REGISTRATION NO: 1996/010374/07

# Collieries Inertisation System (CIS) and Rescue Drill Unit (RDU) Call-out Procedure.

**February 2020.1**

## Contents

## INTRODUCTION

Over the years, colliery committee members of the erstwhile Chamber of Mines, now the Minerals Council of South Africa have made significant investments in equipment used for the rescue of people and the safeguarding of property in underground coal mines. Mines Rescue Services (MRS) is the custodian of the equipment described in this document and they are primarily responsible for rescue missions on mines. The Colliery Training College (CTC) houses and operates the equipment jointly with them and they both are committed to deploying it in a safe and efficient manner to any mine that may require this service.

Member mines contribute annually toward the maintenance of the CIS and the RDU. In addition, a usage levy as determined by MRS from time to time will be applied when these units are called out.

Deployment of the units to test the readiness of the system as would be required in a real emergency situation is encouraged. Furthermore, in order to augment the contributions from member mines, the RDU requires to drill a number of holes for commercial purposes as well. The costs of such deployments are significant and should be planned carefully (without destroying the element of surprise, if that is a need from the mine testing the system). Kindly liaise with the Managing Director, CTC and the CEO, Mines Rescue Services who will assist with your emergency preparedness planning.

This document describes some steps required by various role players in case of an emergency (simulated or real) and is not intended to supersede existing emergency procedures and protocols on any mine. Its intention is to augment these procedures and protocols.

### *Collieries Inertisation System (CIS)*

The paragraphs highlighted in this colour specifically refer to issues pertaining to the CIS.
The Colliery Inertisation System (CIS) is a system to produce inert gas (Nitrogen) used to extinguish underground coalmine fires. The system comprises of two 18m mobile trailers that house a compressor unit and a Nitrogen generating plant (Floxal) together with a mobile 1500KVA diesel generator.
The operating principles of the system are as follows:

- During an underground fire, a means must be established to pump the inert gas to the fire area.
- In the absence of suitable piping or existing boreholes, new boreholes will be drilled from surface into the fire area using the Rescue Drill Unit or other drill contractor.
- While this occurs, the fire area must be sealed off and the total fire area volume should be kept to a minimum.
- The CIS unit will be transported to the intake area of the piping or at close proximity.
- The unit will be coupled and powered up with its own generator set or connected to a suitable power source provided by the mine.
- Piping will be laid from the unit to the intake piping underground.
- The unit will then continue to pump nitrogen into the fire area.

In order to facilitate planning, some technical data of the CIS unit is as follows:

- Floxal unit trailer: 18m including prime mover with a total weight of 42 tons
- Compressor unit trailer: 18m including prime mover with a total weight of 42 tons
- Generator trailer: standard 6 m container trailer

- Nitrogen flow rate at 1800 $m^3$ per hour
- Purity 97% Nitrogen
- Pressure 9 Bar
- Generator prime rating 1120kW/1400kVA, 50Hz, 400VAC
- Generator standby rating 1200kW/1500kWA, 50Hz, 400VAC
- Diesel consumption of generator at 75% load – 212 litres per hour
- Diesel capacity on unit and 1200 litres (6 hours)
- Total piping length of 180 metres available with the unit. (In principle the unit can deliver $N_2$ gas up to 92 km from the CIS through 150mm piping.)
- Piping type 100mm PVC with clamp-on type coupling
- Total take-offs from plant - 4

In the event that the mine can supply the electricity the following will be required from the mine;

- A suitable transformer with standard overload protection that is able to supply 400V at an MVA rating of 1,5MVA (although anything above 1.2MVA will be suitable) with suitable cabling of appropriate dimensions
- Neutral Earthing Resistor Monitor (NERM) panel connected to secondary side of transformer to protect against earth fault
- Protection should be selected to be able to handle any harmonics or feedback caused by the VFD for the heater in the Floxal unit
- Due to the large current drawn on the secondary side, a 2000A breaker with its own protection will be required

## *Rescue Drill Unit*

The action steps highlighted in this colour is specifically required during the deployment of the RDU.

The rescue drill unit comprises the T685WS (Pilot Drill capable of drilling 165mm holes) and the T130XD (Main drill rig capable of drilling 660mm holes) and a number of trailers that contain ancillary equipment such as compressors, drill rods and a mobile workshop. The T685WS is capable of drilling a 165mm hole to a depth of 300m and the T130XD is capable of drilling a 660mm hole to a depth of 300m. In a typical rescue situation the T685WS Drill will try to locate trapped personnel (if communication cannot be established with them via existing means) whilst the T130XD drill will drill the main rescue hole through which the rescue capsule will be lowered to extricate trapped persons.

It is important to note the following circular with regards to important considerations for emergency preparedness in coal mines: **MINES RESCUE SERVICES – MEMBER MINES CIRCULAR No. 02/2020.** The circular is appended to these procedures.

Action steps that are not highlighted are applicable to both the CIS and RDU deployment.

## ACTIONS BY MINE MANAGER DURING A FIRE OR AFTER A FALL OF GROUND:

### 1. Ascertain:

- The magnitude of the emergency, (extent of fire, explosion, etc).
- The exact location of the fire or fall of ground.

- Whether assistance from Mine's Rescue Services is required.
- Whether assistance from Colliery Inertisation System (CIS) or the rescue Drill Unit (RDU) or both is required.
- **Note:** Neither the RDU nor the CIS Unit will be deployed on a mine, unless the Mine Manager / Underground Manager has given the go-ahead and that he authorises that no persons will be affected as a result of the inert gases or drilling activities in the workplace.

## 2. Notify:

- The Group Head Office.
- Manager, CTC or his deputy, after approval has been received from Group Head Office.
- Mines Rescue Services (Pty) Ltd.
- Principal Inspector: Department of Minerals Resources
- Interested and affected parties in the community of the incident and the actions that will follow.

## 3. Discuss transport and fuel requirements of the units to affected site with CTC manager or his designated deputy immediately:

- Arrange for escort to accompany CIS or RDU vehicles to the intended deployment site.
- The route to the deployment site must be adequately watered down to suppress dust and compacted to 50t vehicles.
- The minimum turning radii, maximum inclinations and minimum heights of overhead cables and structures that the equipment can negotiate are as follows.

| | ***RDU*** | ***CIS*** |
|---|---|---|
| Turning Radius | 15m | 30m |
| Maximum Inclination | 1:20 | 1:30 |
| Minimum Height | 4.5m | 4.5m |

- Due to fuel handling activities likely to take place during the deployment of either the RDU or the CIS, fuel spill kits are required in the vicinity of the deployment site.
- Both the RDU and the CIS have firefighting equipment on hand, but the mine must also ensure emergency measures are in place during fuel handling activities.

### *Collieries Inertisation System (CIS)*

- Arrange a supply of diesel for the Generator. CTC will transport an empty bowser to the mine's site. During the operation on the mine, the mine will be required to keep the bowser filled. The requirement will be 200 litres per hour. At the conclusion of the operation, the mine must re-fill the bowser before its return to CTC.

### *Rescue Drill Unit*

- The RDU will require a minimum of two 2000 liter diesel supply tanks to be available on site, whilst drill is in transit or a diesel bowser that is available for the use by the drill team. The document below gives further detail regarding the deployment of the Rescue Drill Unit:

A. The following vehicles will be deployed to your site:
   1. The Schramm T130 ( 52 300kg )

2. The Schramm LoadSafe ( 16 600kg )
3. Rod Trailer No1. ( 46 520kg )
4. Compressor Trailer No.1 ( 38 220kg )
5. Compressor trailer No.2 ( 44 520kg )
6. Liebherr Crane ( 24 000kg )
7. Workshop Trailer ( 18 450kg )
8. Booster compressor ( 32 260kg ) When needed

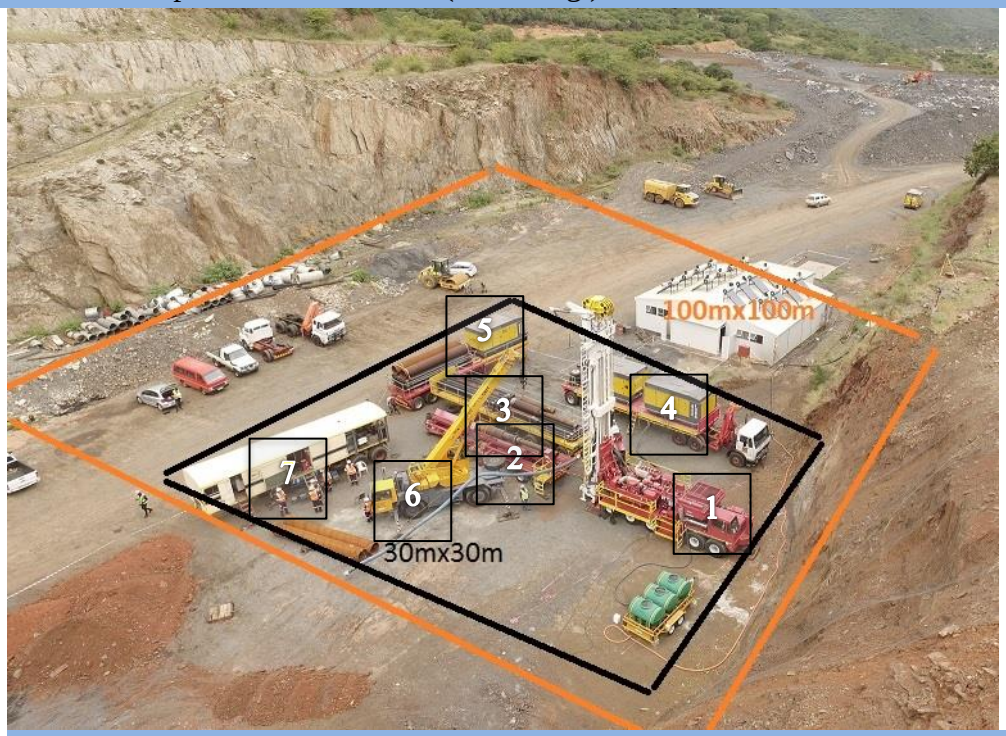


*Figure 1: Typical arrangement of vehicles when RDU is deployed.*

B. In order to safely operate this heavy equipment, an area of 30mx30m needs to be well compacted to ensure that the crane and drill rig with its extended mast, do not fall over during the drilling operation which will involve large quantities of water flooding the area. A dynamic cone penetration test involving a hammer driving a cone into the soil will be performed by the crew before they deploy. The cone should not penetrate the soil to a depth greater than 175 mm after 40 blows. A larger area around this inner area of 100m x 100m needs to be cleared to ensure that the vehicles can turn and manoeuvre into position around the peg where the borehole is to be drilled.

C. It is the mine's responsibility to ensure the following is available during the time of deployment:

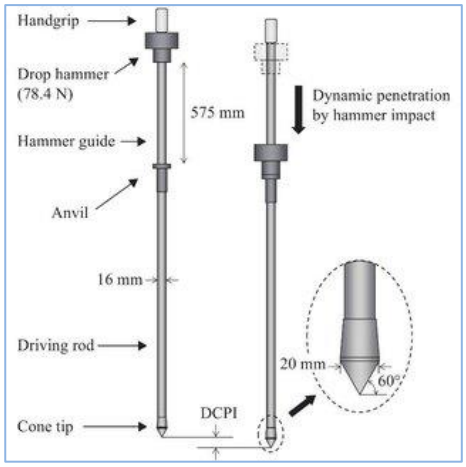


*Figure 2: Dynamic Penetration Tester*

1. Access road to carry weight of equipment;

2. Overhead lines or bridges to be higher than 5m;
3. Bridges must be able to carry weight of equipment;
4. Gates to site to be wide enough to accommodate vehicle width (4m);
5. Corners must be able to accommodate vehicles;
6. Porta toilets for team on site;
7. Security guards after hours ( sunset to sunrise)
8. Water for drilling – 30 000 litres;
9. Diesel: the approximate quantity will be discussed with you but a 75m hole usually requires about 7500 litres;

D. Before deployment can take place it will be your responsibility to ensure that the equipment that we intend to deploy complies with your requirements. The RDU team ensures legal compliance on all equipment, but your safety officials are welcome to inspect our equipment to ensure that we comply with your requirements.

E. The RDU team will also require induction before working on your site; it is required that this be arranged before the deployment.

## 4. Inform Mines Rescue Services immediately of:

- The number of rescue teams required;
- The number of seals to be urgently installed to contain the fire.

## 5. Establish / Take Charge of Control Room

Proceed to control room at shaft and take charge. On arrival at control obtain all available information and in consultation with the ventilation Superintendent, arrange to withdraw all persons who may be affected.

## 6. Make arrangements:

- Pinpoint the area where the fire and/ or fall of ground are likely to be on the underground plan. The surveyor should draw a detailed plan and section of each such area.
- If the information is available, a geological section of the possible types and thickness of the geological successions must be drawn from surface to the underground workings.
- A contour plan of the area that will be inertised will be required to determine the position of the holes to be drilled. The above areas should be located accurately on surface. Access roads to the site(s) for all vehicles to be established. Where possible GPS Co-ordinates to be determined. Sites to be cleared of obstructions as the CIS units are on low-bed trailers.

## 7. Note the area requirements to deploy the units

- The T685WS probe drill on its own requires 50mX50m
- The T685WS/CIS units combined requires 100mX100m
- The T130XD main rescue drill requires 100mX100M
- A thorough assessment of the site regarding stability of the surface must be carried out prior to site establishment. If the surface is clayey, as many loads of G5/G6 road mix as may be required must be provided to stabilise the area under and around the machines.
- A front-end loader must be made available on site, and in wet clayey conditions the biggest available bulldozer must be made available as well.

- Access points to be manned by security guards to prevent unauthorised entry by persons.
- Arrange for security access for CTC Rescue drill and Inertisation team members to mine property e.g. workshops, mine store etc.
- If possible establish communication on site.
- If assembly of the equipment is required after sunset, please arrange portable lighting.
- Establish the location of any heavy mechanical equipment such as cranes (10 ton minimum), road graders, bulldozers, tractors, front-end loaders and water tankers that may be in the district (Provincial Roads Department, erection and construction firms, etc.) and its availability if and when required.
- Arrange accommodation, catering, ablution facilities and drinking water for the Rescue / Inertisation / or both teams and technical staff.
- If required, assist the RDU team with the provision of items such as picks, shovels, hammers and tools and fittings for pipes; sufficient lengths of plastic or rubber compressed air hosing (25mm and 50mm); mine poles and planks, 100mm piping for nitrogen; hemp rope and uprights for cordoning off areas.

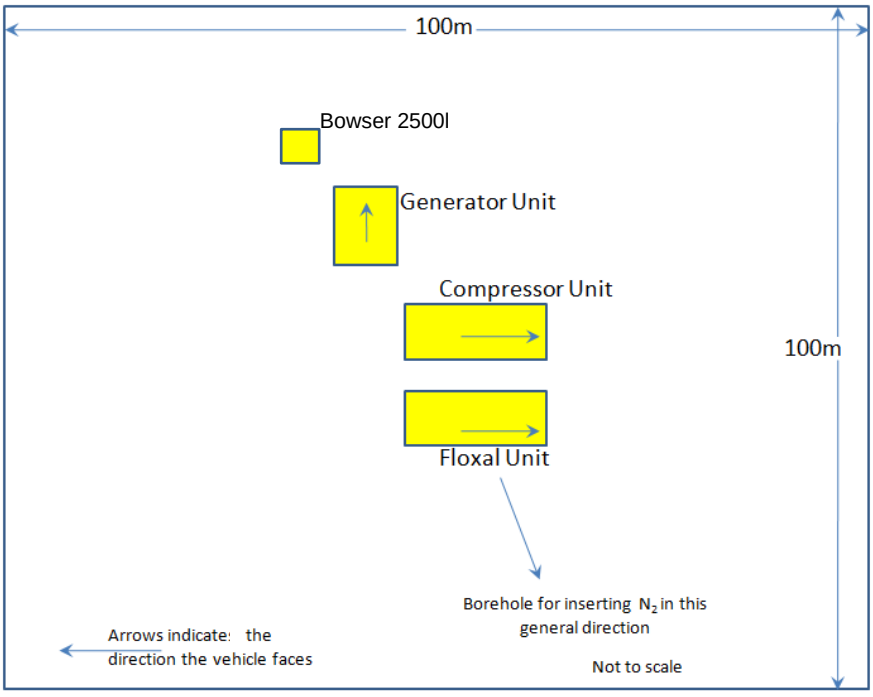


*Figure 3: CIS General layout. Please note that the T685WS drill (as sketched below) may be deployed anywhere within the boundary indicated above.*

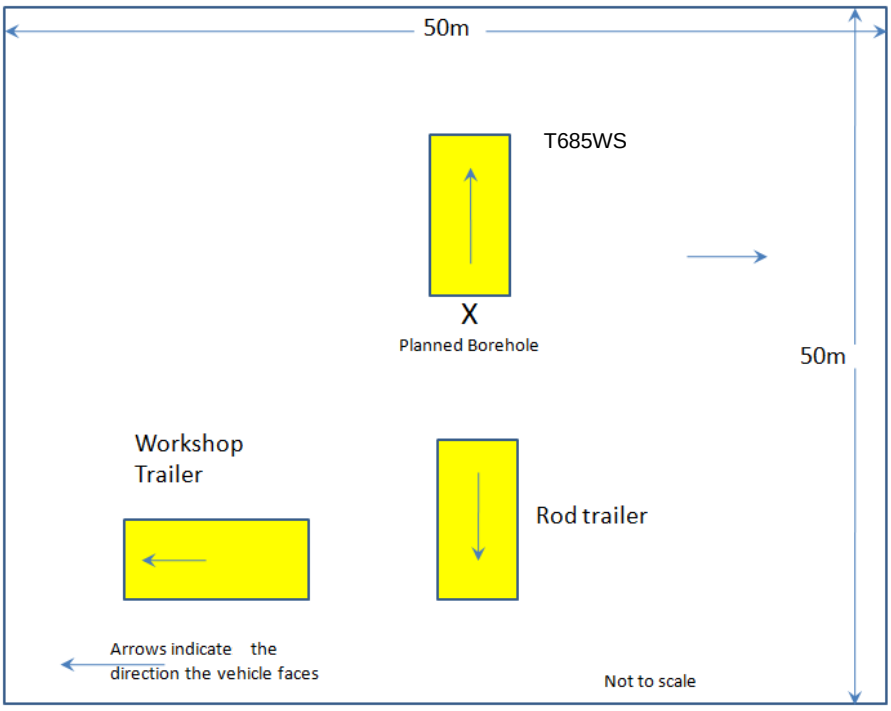


*Figure 4: T685WS General layout for drilling a probe hole or an $N_2$ injection hole with the T685WS.*

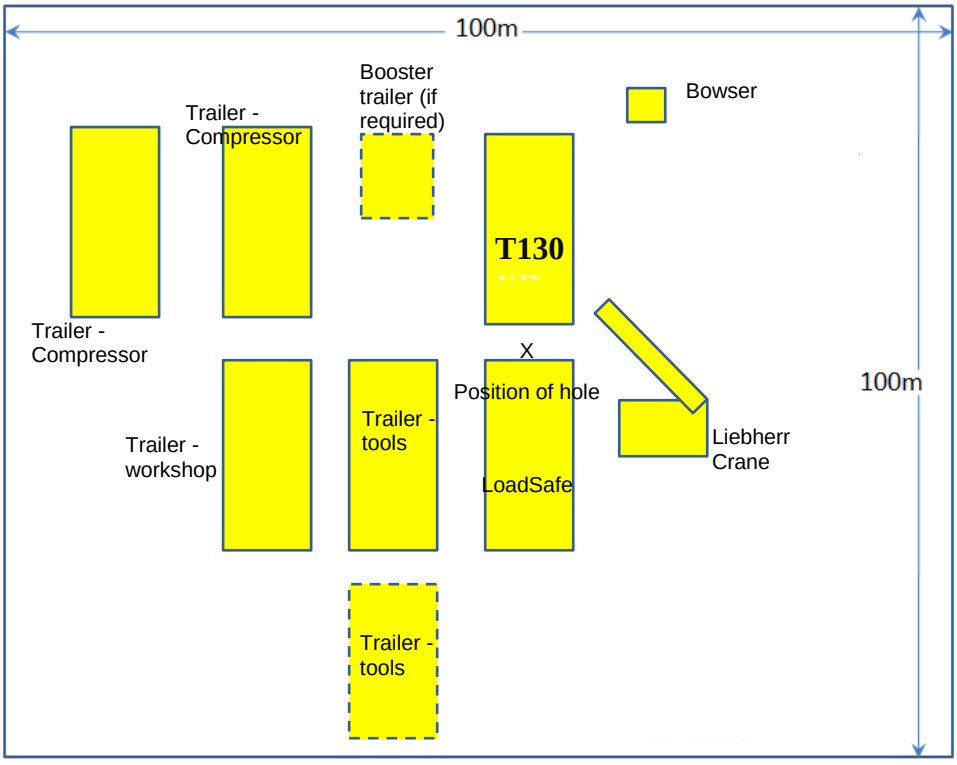


*Figure 5: General layout of the T130XD deployment for drilling a 660mm rescue hole. Note that additional rod trailers are required for deeper holes. CTC management will advise the number of rod trailers that will be deployed.*

## 8. Arrange for the following to be notified when necessary:

- **Telkom** - for assistance with regard to communications – only required should cell phones not be operational in the area.
- **South African Police Services** - for assistance with regard to security.
- **ESKOM** - for assistance with regard to the provision of power at the emergency site.

**The following supplies to be available for lowering to trapped men:**

- Water
- Hot soup (meat or vegetables)
- Milk
- Orange juice
- Biltong
- Chocolate
- First aid equipment

## ACTION BY GROUP HEAD OFFICE

According to information at his disposal the Consulting Engineer will decide whether CTC Rescue Drill Unit or Inertisation Unit or both

- is required immediately;
- should be alerted.
- Prepare a report of the emergency for release to the media.

## IMMEDIATE ACTIONS BY CTC MANAGER OR HIS DESIGNATED DEPUTY:

If the CTC Rescue Drilling Unit and / or Inertisation Units are required, the following arrangements will be made:

### 1. Site assessment:

A senior staff member will be dispatched to the mine to assess site conditions and make recommendations regarding site preparation and ground stabilisation. He will establish control of the surface drill operation.

### 2. Security access and communication

Arrange for security access for crew to the mine property and set up communication between the mine and CTC.

### 3. Notify:

- Rescue Drill / Inertisation Unit Crews
- Local Traffic Department: - To facilitate the movement of equipment along municipal roads.
- Provincial Traffic Department: - To facilitate equipment on public roads and to divert unauthorised traffic from the emergency zone.
- Collieries Environmental Control Service (CECS) – Evander that will send staff with mobile gas analysing equipment to the site.
- Air Liquide and Gen Doctor

**4. Arrange for transport of the required units:**

**IMMEDIATE ACTION BY MANAGER, MINES RESCUE SERVICES OR HIS DESIGNATED DEPUTY**

**1. Arrange:**

- Call-out of Rescue Teams
- Assist CTC with movement of CIS units
- Establish Control Centre at surface drill site
- Arrange with Mantella Trading for standby personnel and additional roll-a-wall stoppings to be sent to the site of the emergency or placed on standby if required.
- Additional equipment which might be required consists of the following items:
- Complete roll-a-wall stoppings
- Tunnel doors
- Hilti drills and accessories
- Notify Air Liquide and Genset Doctor

**IMMEDIATE ACTION BY MANAGER, AIR LIQUIDE**

**1. Arrange:**

- For maintenance personnel to be sent to the site of the emergency.
- The equipment which is housed and transported with the CIS Unit and which might need maintenance consists of the following items:
- Floxal Unit
- Atlas Copco compressors

**IMMEDIATE ACTION BY MANAGER, GENSET DOCTOR / CUMMINGS**

**1. Arrange:**

- For maintenance personnel to be sent to the site of the emergency or placed on standby if required.
- The equipment which is housed and transported with the CIS Unit and which might need maintenance consists of the following items:
- Generator

## TELEPHONE NUMBERS

Although care was taken to ensure that these numbers are correct at the time of publishing, the user is advised to take responsibility for ensuring that he or she keeps an updated list of emergency telephone numbers.

| DEPARTMENT MINERAL RESOURCES<br>MINE HEALTH & SAFETY : MPUMALANGA REGION | | |
|---|---|---|
| **OFFICE NUMBER : 013-653 0500** | **FAX-013-6902390 / 013-6903288** | |
| EL Letsoko | elliot.letsoko@dmr.gov.za | 082 461 5527 |
| HH Netshikweta | herbert.netshikweta@dmr.gov.za | 082 521 9525 |
| A Zide | ayanda.zide@dmr.gov.za | 071 475 8514 |
| S Makwela | stephen.makwela@dmr.gov.za | 082 787 3341 |
| Z Zikhali<br>T Baloyi | zama.zikhali@dmr.gov.za<br>teddy.baloyi@dmr.gov.za | 082 059 8531 |
| MA Simelane<br>NC Mashamba-Ramadi<br>EC Nxumalo | menzi.simelane@dmr.gov.za<br>charity.ramadi@dmr.gov.za<br>crosby.nxumalo@dmr.gov.za | 082 499 1604<br>082 787 3342<br>072 612 4366 |
| AB Nkosi | aaron.nkosi@dmr.gov.za | 082 787 3368 |
| N Bunguza | nozzy.bunguza@dmr.gov.za | 071 475 8470 |
| M Mpempe<br>T Mokoena<br>F Moleleki | meshack.mpempe@dmr.gov.za<br>thabiso.mokoena@dmr.gov.za<br>fefa.moleleki@dmr.gov.za | 084 728 6237<br>074 968 8771<br>071 281 9638 |
| B Matshingane<br>S Mabena | betty.matshingane@dmr.gov.za<br>sebatienne.mabena@dmr.gov.za | 082 458 1413<br>079 872 5060 |
| H Maphophe<br>E Molamodi<br>T Thanza<br>L Makhongwana<br>T Mathanga<br>N Khaba<br>I Kgope | hazel.maphophe@dmr.gov.za<br>ephraim.molamodi@dmr.gov.za<br>thabo.thanza@dmr.gov.za<br>lebogang.makhongwana@dmr.gov.za<br>thando.mathanga@dmr.gov.za<br>nonhlanhla.khaba@dmr.gov.za<br>Isaac.kgope@dmr.gov.za | |

| | | |
|---|---|---|
| **MINERALS COUNCIL OF SOUTH AFRICA (Switchboard) 011-498 7100** | | |
| Technology Analyst | Christian Teffo | 011 498 7312<br>073 418 1869 |
| Senior Executive | Sietse Van Der Woude | 011 498 7423<br>082 565 9343 |
| **CTC WITBANK** | | |
| Managing Director | JJ Venter | 013 692 3121<br>083 389 3588<br>082 682 8406 |
| RDU Manager | L Schoombee | 013 692 3121<br>082 555 1430 |
| RDU Team Leader | A Nieuwoudt | 013 692 3121<br>072 765 9017 |
| **MINES RESCUE SERVICES (PTY) LTD – CARLETONVILLE 018-781 1141/ 42** | | |
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| Chief Financial Officer | D Williams | 071 606 7492<br>082 374 4561 |
| **MINES RESCUE SERVICES (PTY) LTD – EVANDER 017-632 122/ 4671** | | |
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| Asstant Managers | EP Horn | 082 629 7091<br>017 631 4333 |
| | W Jacobs | 076 575 6292<br>017 631 5306 |
| | J Joubert | 082 491 5902<br>017 631 5269 |
| **COLLIERIES ENVIRONMENTAL CONTROL SERVICE EVANDER 017-632 1030/1** | | |
| Manager CECS | B Richards | 017 632 1030<br>082 306 1744 |

| | | |
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| **AIR LIQUIDE** | | |
| Technician | Collin | 011 389 7089<br>082 457 6848 |
| Technician | Max | 011-389 7005<br>082 965 1131<br>082 457 6848<br>065 953 8462 |
| Electrical Technician | Sipho Khumalo | 011 389 7117<br>083 477 7815 |
| | Thebogo | 082 872 0673 |
| **V-POWER AFRICA** | | |
| | A Wilson | 012 253 5987<br>082 852 0785 |
| | K v/d Merwe | 011 907 8889<br>082 792 7893 |
| **GENSET DOCTOR** | | |
| | Steven Baines | 011 787 7225 |
| | JJ | 083 790 1507 |
| | Call Centre | 087 135 0761 |
| **MANTELLA TRADING** | | |
| | Charl Venter | 013 690 1069<br>082 891 0342 |
| | Chris de Beer | 082 650 9099 |
| **PMC TRANSPORT** | | |
| | Fernando Bico | 013 692 6802<br>082 261 3017 |
| **ABNORMAL LOAD TRANSPORT AND TECHNICAL CONSULTANTS** | | |
| | Leon De Beer | 011 902 2625<br>082 553 1702 |
| **HIGHVELD HOSPITAL** | | |
| | | 013 656 9101 |

| | | |
|---|---|---|
| | **HIGHVELD HOSPITAL (Continued)** | 013 656 9102<br>013 656 9103<br>013 656 9104 |
| **ESKOM MPUMALANGA** | | |
| After Hours | | 086 000 1414 |
| Eskom Park | | 013 693 3111 |
| Regional Customer Executive Mining Manager | M McKenzie | 013 693 3930<br>082 573 1354 |
| PTM Manager | Aswin Pillay | 013 693 3557<br>083 655 0322 |
| **ESKOM GAUTENG** | | |
| Braamfontein | | 011 711 9111 |
| Vereeniging | | 016 430 7000 |
| Nigel | | 011 814 1212 |
| Benoni | | 011 741 3471 |
| **ESKOM KWAZULU/NATAL** | | |
| Durban | | 031 360 2111 |
| Newcastle | | 034 315 1348 |
| Vryheid - control room 24-hour service | | 086 020 4560 |
| **CALTEX** | | |
| | Maruis Marais | 083 421 6499 |
| | Craig Jones | 083 2717 266 |
| **N4 PETROLEUM** | | |
| | Pieter van Rooyen | 082 447 5306 |
| **BARLOW WORLD** | | |
| | Ramon Glaus | 011 929 0584 |
| | | 078 800 5720 |
| **HIGHVELD TYRES** | | |
| Witbank Branch office | | 013-692 5021 |

| | | |
|---|---|---|
| Manager | Mr Van Heerden | 082 332 0206 |
| **RAND AIR** | | |
| | Mrs Chantelle Bekker | 013-246 1473<br>083 643 9077 |
| **MTU – DETROIT ENGINES** | | |
| | Werner Kluge | 011 570 4905<br>082 464 9215 |
| | Frans Du Buisson | 082 464 9215 |
| | | |
| **KUTANA HYDRAULICS** | | |
| | Deon van Tonder | 013 246 1018<br>082 555 0655 |
| | Boela van Tonder | 082 920 8359 |
| | | |
| **MINCON** | | |
| Managing Director | Jaco Scott | 011 397 3630<br>082 414 9425 |
| Divisional Manager | Brain Coetzee | 011 397 3630 |
| | | 082 887 0453 |
| **PCF TRANSPORT ADVISORS** | | |
| | Laurinda Steyn | 012 332 2299 |
| | Johnny Van Sittert | 012 332 2299 |
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| **MIDWIT DIESEL OIL** | | |
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welkom@minesrescue.co.za


10 February 2020

## MINES RESCUE SERVICES – MEMBER MINES CIRCULAR No. 02/2020

Dear Sir / Madam;

## MOBILE RESCUE CHAMBER IN THE MINING INDUSTRY

As technology evolves within the mining industry it brings to light many unforeseen challenges and should be viewed within a holistic approach.

Lately, we take note that there are many enquiries related to Mobile Refuge Chambers in the Mining Industry.

Mines Rescue Services want to bring to your attention that these Mobile Refuge Chambers are in contradiction with our rescue strategy and capabilities. The South African Collieries have collaborated with MRS in obtaining amongst others, the Schramm Rescue Drill, the 1200m Colliery Mobile Rescue Winder with its Rescue Capsule to rescue people that had to make use of a conventional underground Refuge Chamber during an emergency or fire.

The methodology behind this Rescue Equipment is to locate the Refuge Chamber position from the surface and should there not be a pre-drilled hole available, to drill a 165mm probe hole. This hole would serve to set up communication and to supply in the immediate needs of the affected persons trapped in the Refuge Bay. A 660mm Rescue hole would thereafter be drilled and persons would be rescued one at a time by means of the Rescue Capsule and the 1200m Colliery Mobile Rescue Winder.

The duration of such an exercise could be an extended period depending on the site preparation, depth of hole to be drilled, penetration rate and any other unforeseen issues.

Taking the above into consideration, making use of steel mobile Refuse Chambers can be of high risk. During a fire whereby people find themselves in such a Refuse Chamber, they would have to be rescued in possibly zero visibility, opening the doors of such chambers to be retrieved with possible high gas concentrations and being transferred to the rescue capsules under these conditions.

It is therefore advised that the use of such Mobile Chambers be avoided, or a rescue strategy be included into the Mines' Emergency Preparedness and Response strategy and shared with Mines Rescue Services as far as reasonably practical.

Please note that the following deployment procedures can be found on our website:
http://minesrescue.co.za/specialized-equipment/

1. The Schramm T130XD 660mm,
2. The Schramm T685 165mm Probe Drill,
3. The 1200m Colliery Rescue Winder and Rescue Capsule as well as
4. The Collieries Inertisation Unit used to Inertise Coal Mine Fires with Nitrogen.

Yours faithfully,

**Mannas Fourie**
**CHIEF EXECUTIVE OFFICER**
**MINES RESCUE SERVICES**
***USER/CIRC/MEMMINES/02-2020***

# 1000m Colliery Rescue Winder


- 1 000m Vertical or Inclined lift
- 660mm Drilled Rescue Hole
- Hydraulic powered single drum hoist
- SWL 1 persons + capsule 750Kg
- Rope diameter 13mm
- Rope Breaking Strength 15 450Kg / 154.5kN
- Rope Weight 0.86kg/m
- Operating speed 0.35 meters per second
- Camera Recording and Full Communication
- The rescuer will abort, load and send out persons to be rescued