





Serving the
Mining Industry

EMERGENCY PREPAREDNESS IN SOUTH AFRICA

BY

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MINES RESCUE SERVICES



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INTRODUCTION

Mines Rescue Services is a private sector organization, which trains volunteers for rescue work and administers a rescue service scheme, to provide rescue and recovery services, resources and expertise for an effective emergency service primarily for the South African mining industry.



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MISSION STATEMENT

Our mission is through the training of voluntary brigadesmen to provide an efficient fire-fighting, rescue and recovery service, on a cost efficient basis, with the objective of minimising the loss of life and assets.



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SERVICE PROVIDED

- Training Rescue Team Members to a competency of the required skills;
- Providing expert advice and consultancy service to all member mines;
- Remaining proactive to changes in technology in the mining industry and environment;
- Providing and maintaining specialised rescue equipment for all member mines.



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MINE DISASTERS





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COALBROOK DISASTER

The Coalbrook disaster on 21 January 1960 where 435 mine workers lost their lives is still the worst mining disaster in South African mining history.





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Emaswati Colliery – 8 June 1991





Welkom
ARM 3 Shaft
22- 24 May 2012



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What is expected from our member
mines?



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MINE HEALTH AND SAFETY ACT, 1996 (ACT NO 29 OF 1996)

Chapter 16.5 Emergency Preparedness and Response



Regulation 16.5 (1)

- Every employer at every underground mine must maintain teams in the following ratio:
 - 200 and 1100 underground employees - 1 team
 - 1101 and 3600 underground employees - 2 teams
 - 3601 and 8100 underground employees - 3 teams
 - More than 8100 underground employees - 3 teams and at least 1 additional team for every additional 6300 employees



REGULATION 16.5 (1) (C)

The employer at every underground mine must-

- “enter into a contract with a mines rescue service provider to
- (i) coordinate and facilitate the provision of mines rescue teams and other services, relating to an emergency, on a cooperative basis
 - (ii) Train rescue team members contemplated in regulation 16.5(1)(a) to the competency level contemplated in regulation 22.15(16)(a) and
 - (iii) Train persons to manage the control room in case of an emergency where mine rescue teams are deployed”



FIRE STATISTICS

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CAUSES OF GOLD MINE FIRES

1981 TO 2014



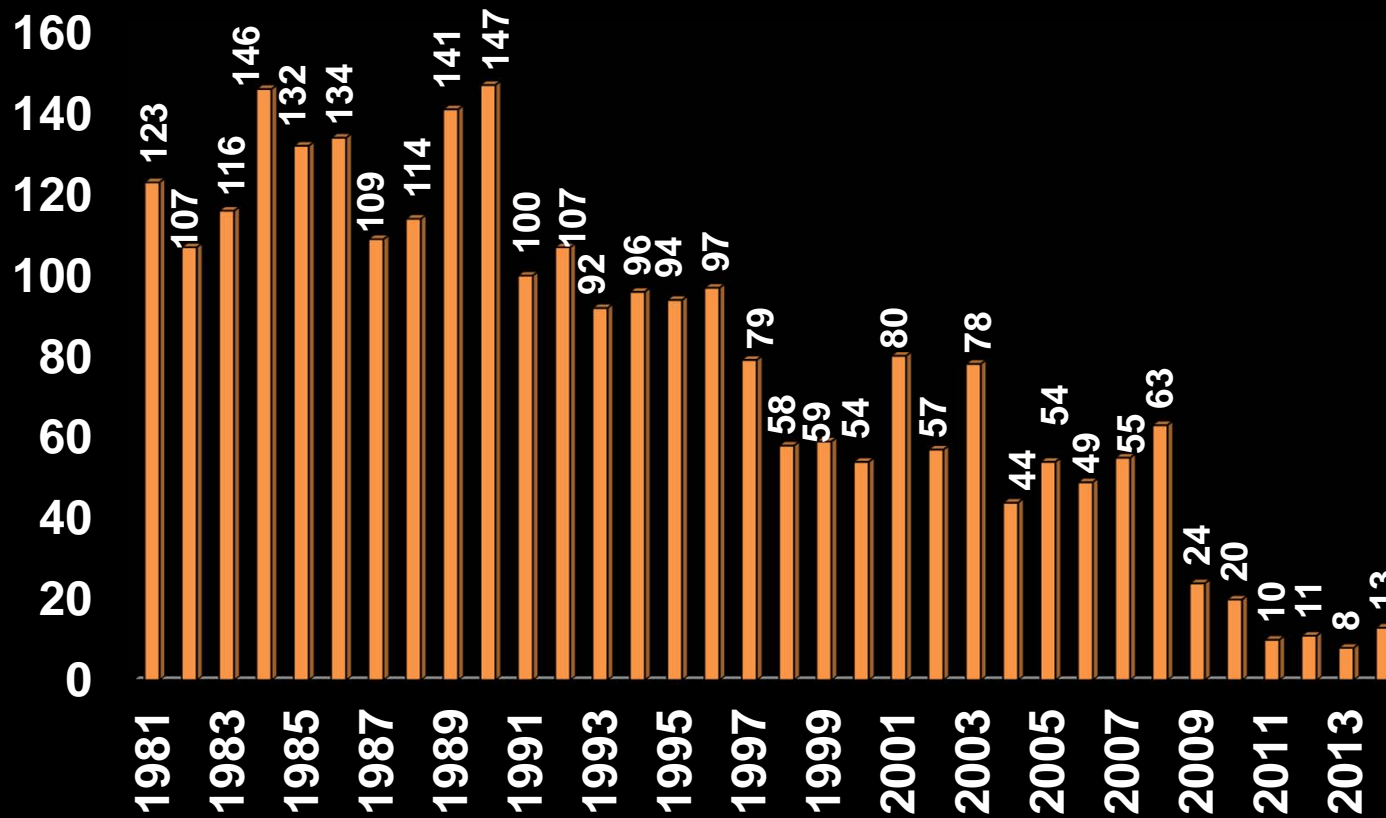
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UNKNOWN	949
OTHER	44
CUTTING AND WELDING	215
ELECTRIC	645
FRICTION	80
SPON. COM.	20
SMOKING	78
EXPLOSIVES	301
SUSPECTED ARSON	214
VEHICLES/DIESEL	54
FLAMMABLE GAS	51



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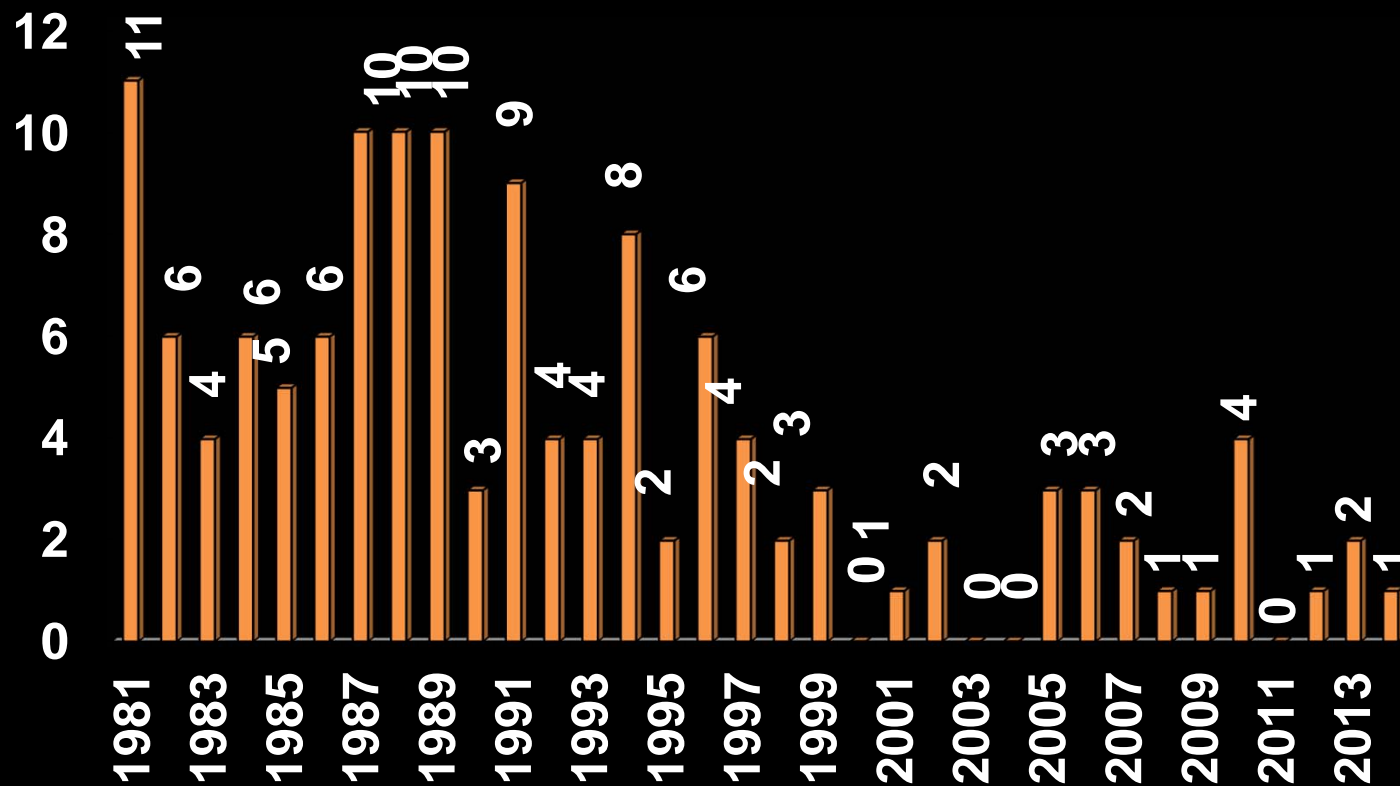
METALLIFEROUS FIRES 1981 – 2014





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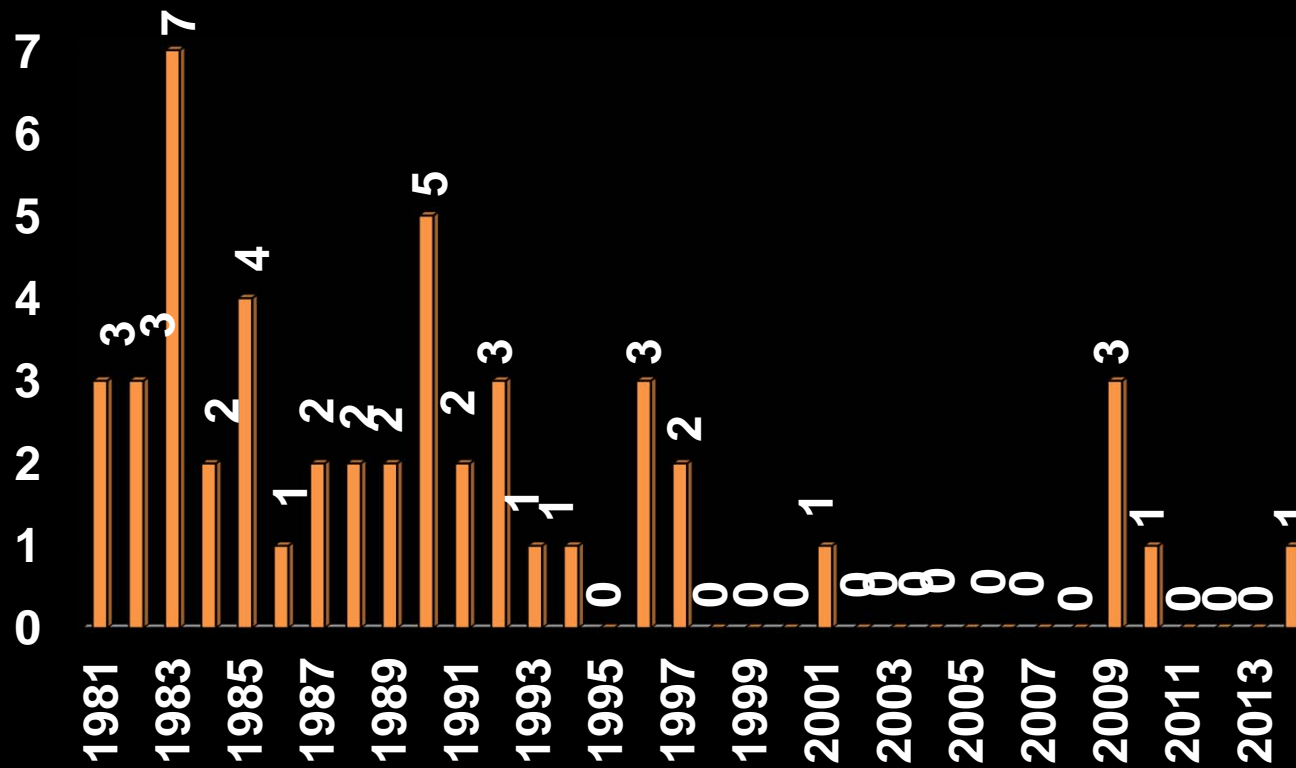
COLLIERY FIRES 1981-2014





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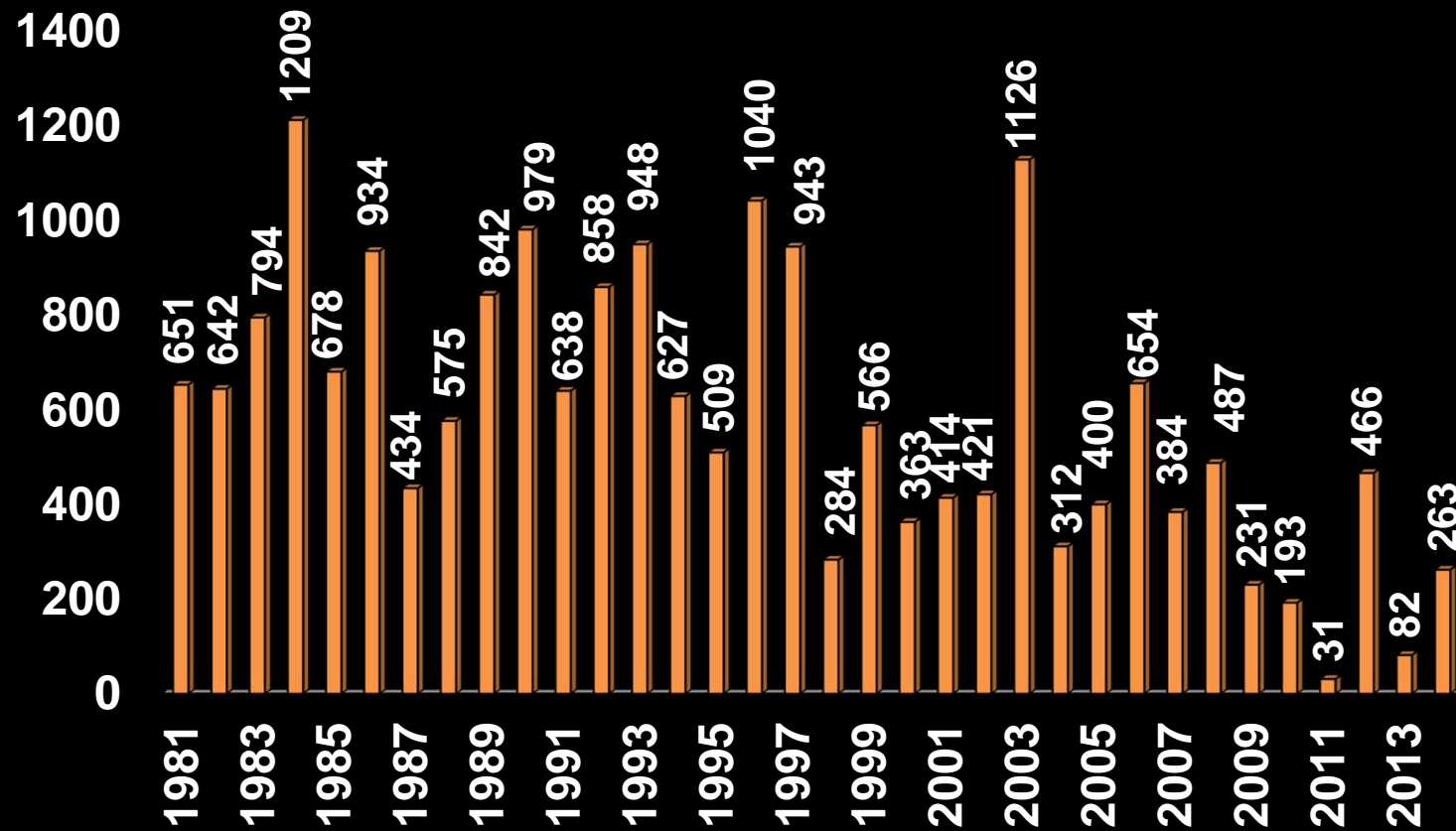
COLLIERY EXPLOSIONS 1981 - 2014





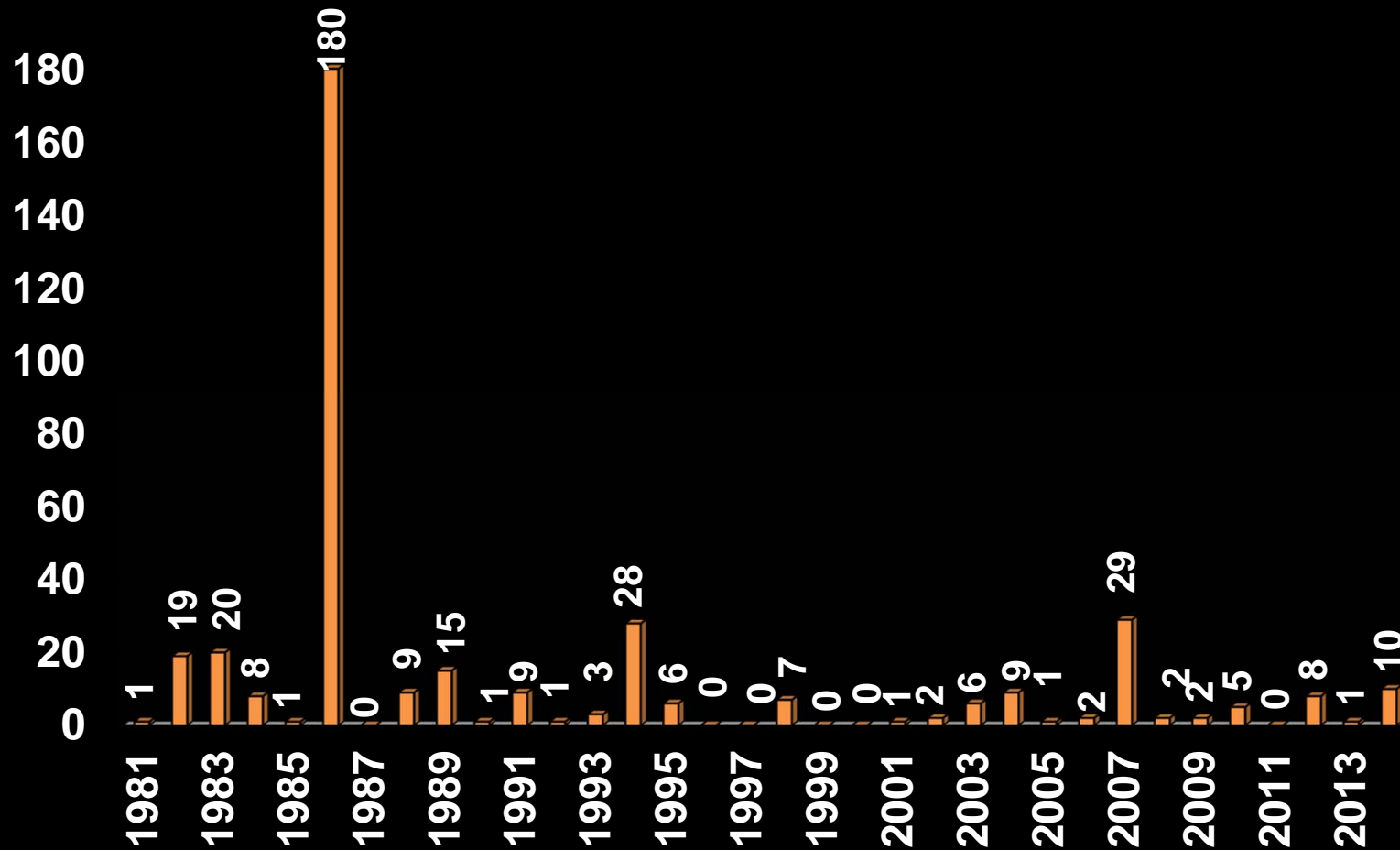
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RESCUE TEAM USAGE 1981 - 2014





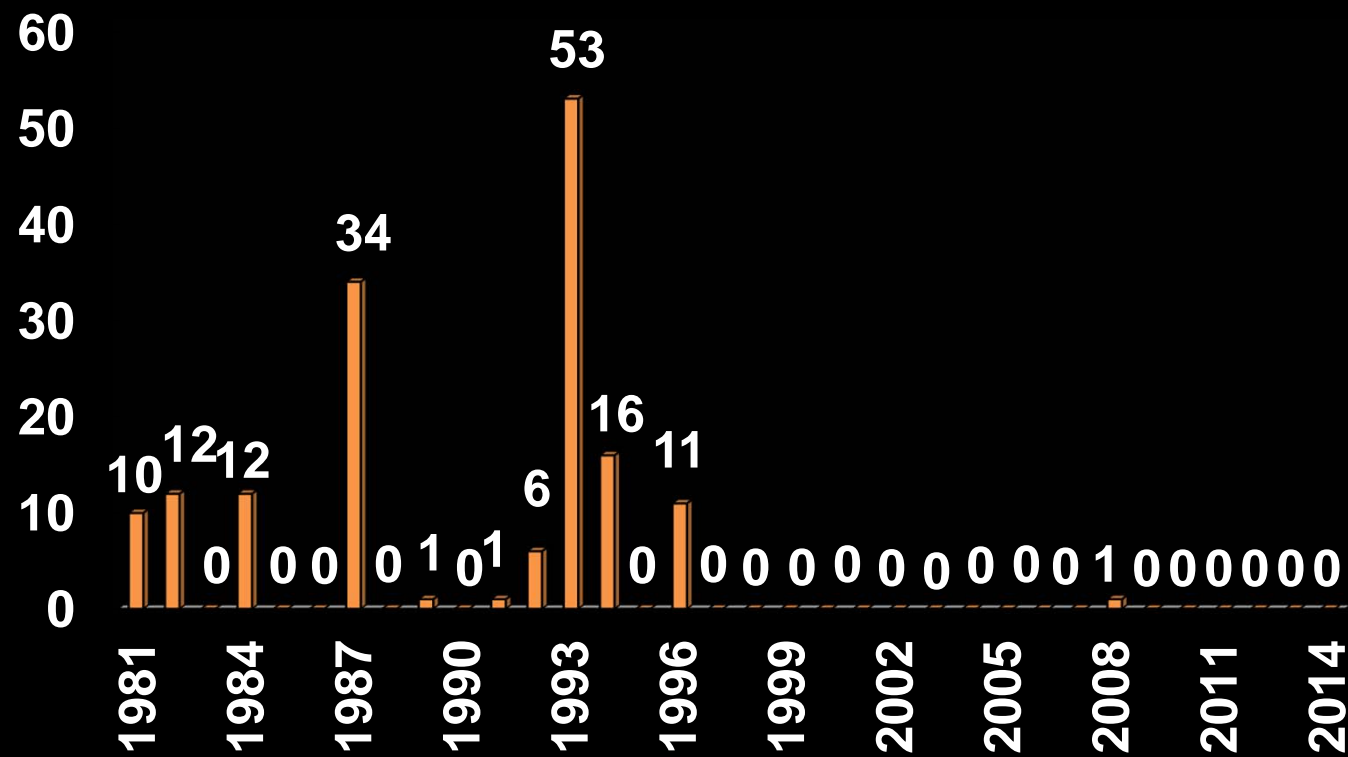
Metalliferous fatalities due to fires & explosions 1981 -2014

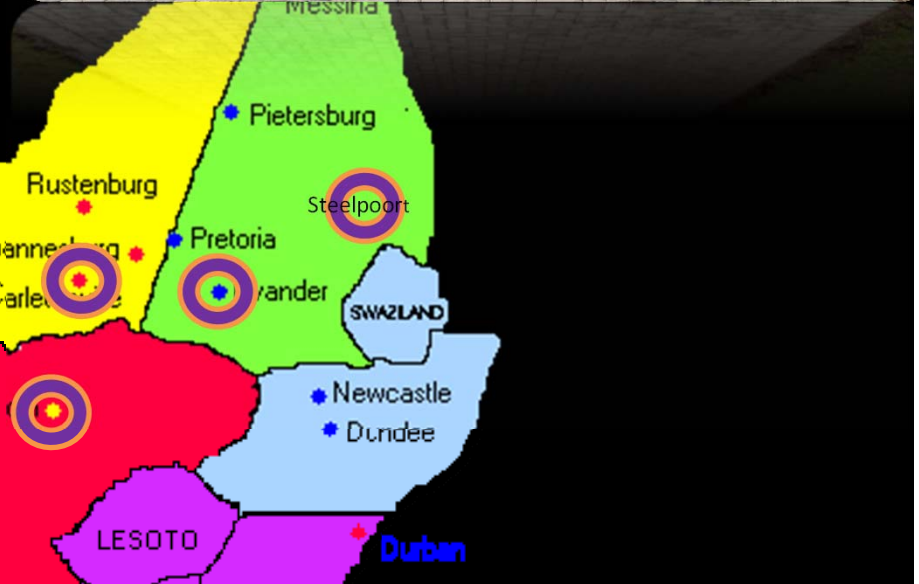




COLLIERY FATALITIES DUE TO FIRES & EXPLOSIONS

1981-2014

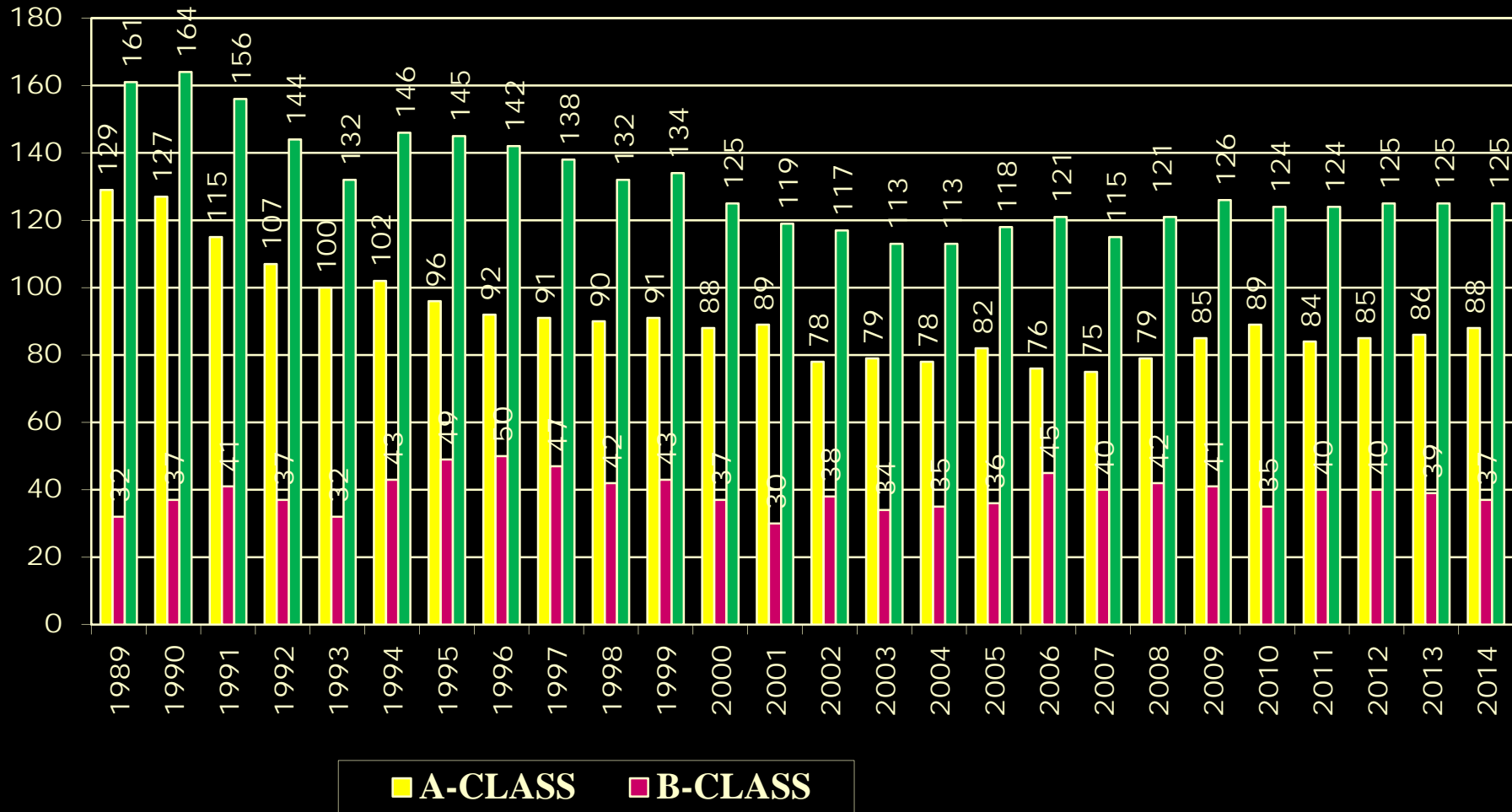






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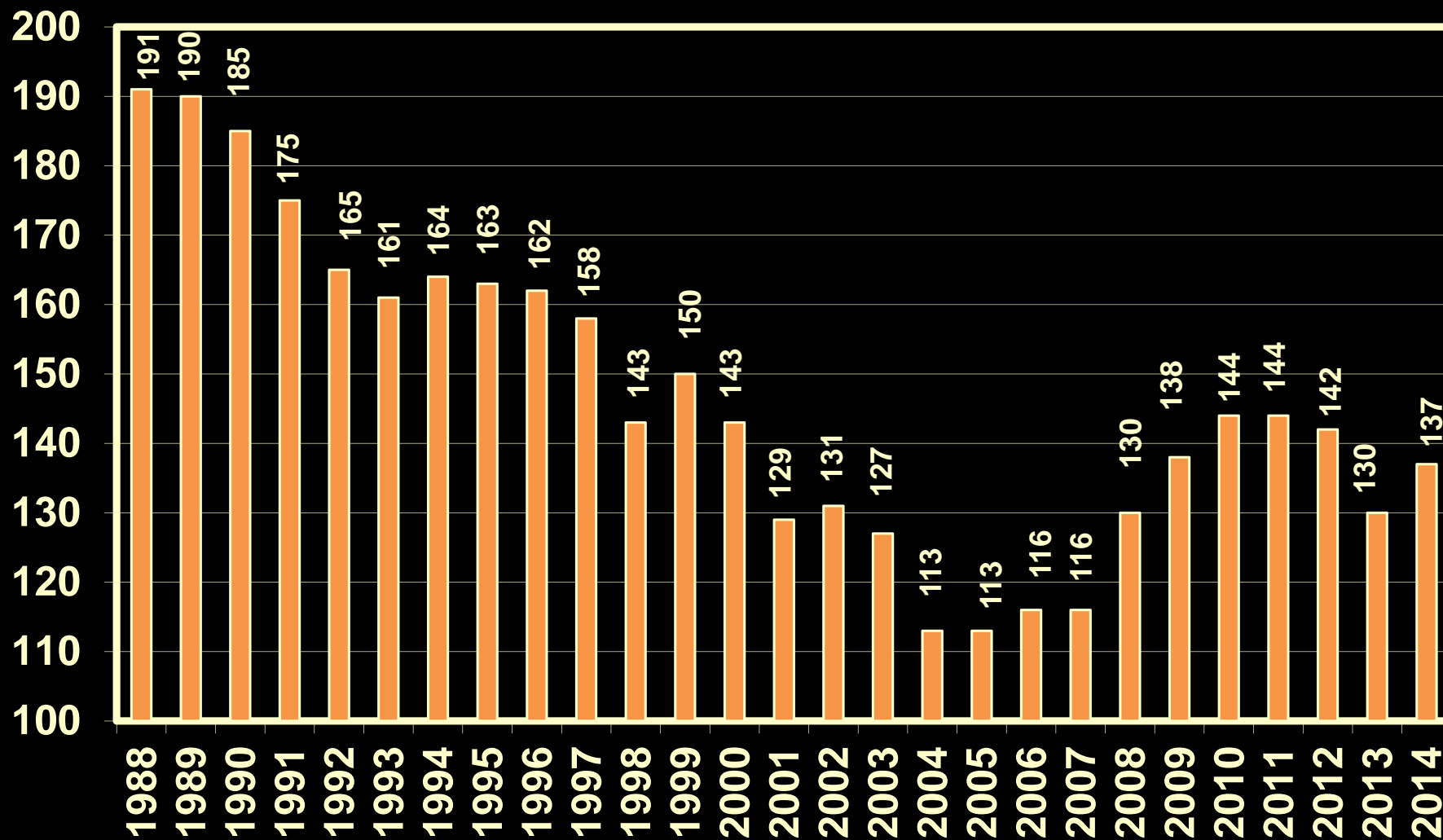
M.R.S. MEMBER MINES





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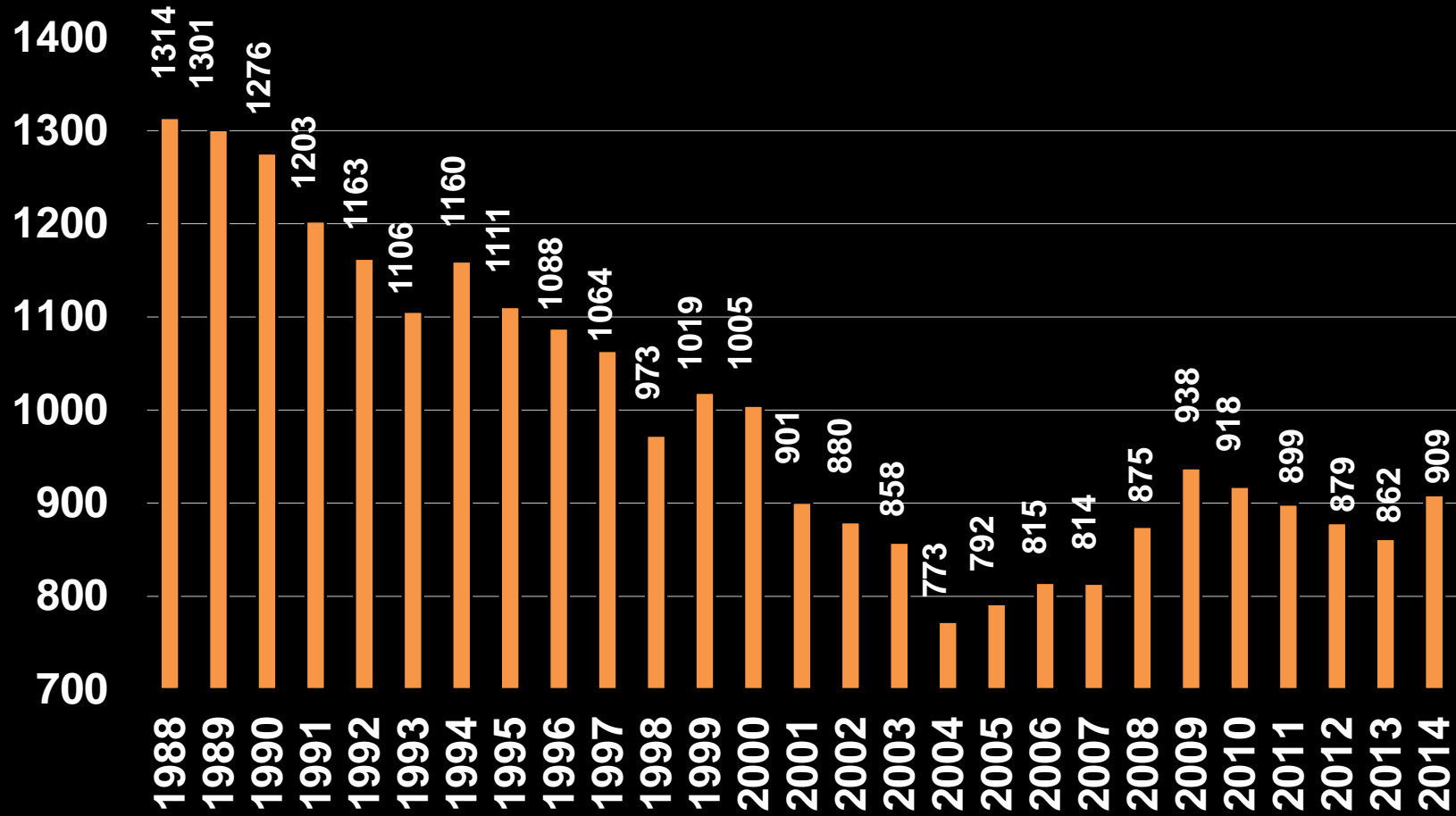
MRS - RESCUE TEAMS





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MRS BRIGADE STRENGTH





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RESCUE TEAM MEMBER TRAINING



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INITIAL TRAINING COURSE



- 5 day practical and theoretical course on the use of breathing apparatus and fire fighting techniques
- Candidates to complete Work Load Test at end of course



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HEAT TOLERANCE TEST



- 24 Steps per minute
- 31,7 °C W/B
- 33,2 °C D/B
- One hour
- Rectal temperature
- $\leq 39.0^{\circ}\text{C}$ heat tolerant.
- $\geq 39.1^{\circ}\text{C}$ not heat tolerant



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WORK LOAD TRAINING





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WORK LOAD TRAINING





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MINES ROPE RESCUE



- Three-day training on the application of various rope techniques
- Basic skills in:
 - Griptech
 - Skyjack
 - Rescue Winders



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BOREHOLE TRAINING



- Selected brigadesmen from collieries are trained to be lowered through a 60 cm. hole drilled by Collieries Rescue Drill Unit



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CONTROL ROOM MANAGEMENT COURSE

(Regulation 22.15(16)(b))

- One day course specially designed for competent persons to take charge of a control room
- Objective is to inform candidates of:
 - The structure of Mines Rescue Services
 - Modus Operandi of rescue team members
 - Control Room Procedures



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RESCUE EQUIPMENT



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DRÄGER BG 4





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BODY COOLING GARMENTS





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LONG DURATION SELF - CONTAINED SELF RESCUERS





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RESCUE VEHICLES





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VARIAN CP 4100 GAS CHROMATOGRAPH



- Fastest GC in the world (200 seconds)
- Portable
- Accurate up to 1ppm
- To detect spontaneous combustion and analyze gases from colliery fires



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TRAPPED PERSON LOCATION DEVICE





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THERMAL IMAGING CAMERA





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SUB STRATA RADIOS





LIFTING EQUIPMENT

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ROPE RESCUE





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Shaft cameras



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Rover Ore Pass camera







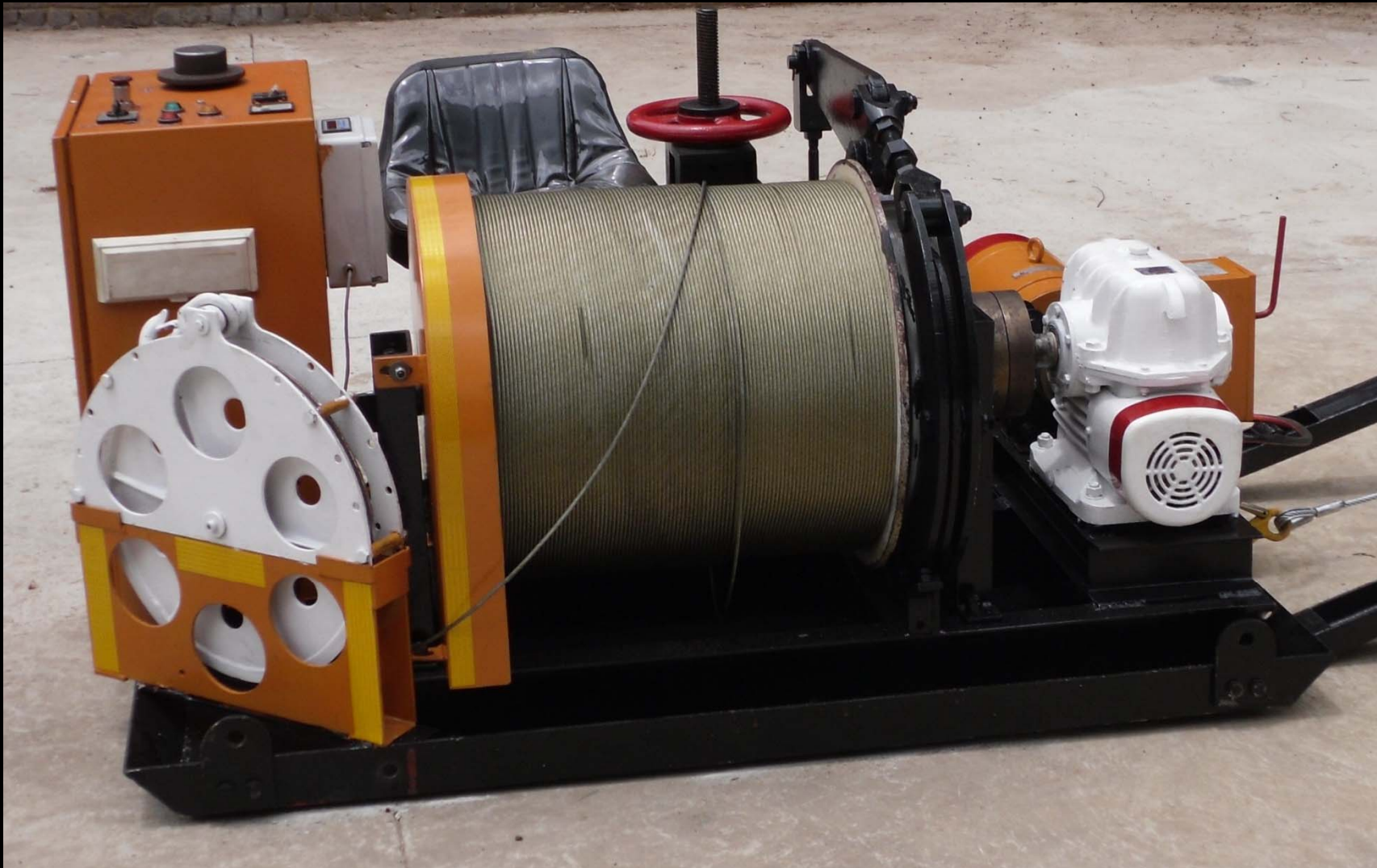
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1200 m RESCUE WINDER





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EMERGENCY MOBILE RESCUE WINDERS





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METALLIFEROUS SINGLE DRUM MOBILE RESCUE WINDER

- Raise/lower 5 persons at a time
- Length of wind : 3100m
- Maximum Conveyance Speed : 1.1 m/s
- Maximum load : 1.23 tonnes















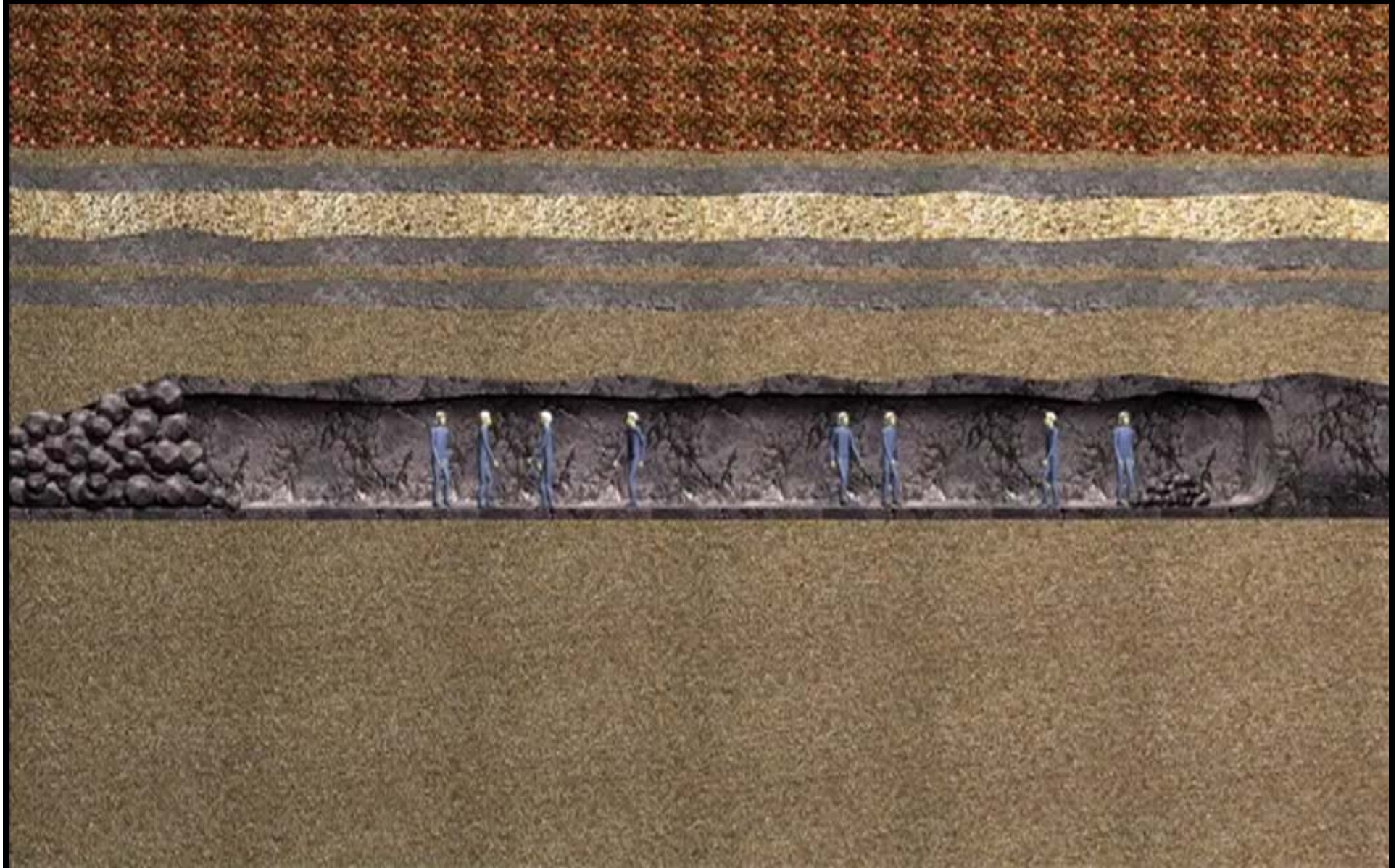
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Colliery Rescue Drill Unit



Schramm T685 probe hole drill







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SCHRAMM T130XD















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Colliery Mobile Rescue Winder















Supply winder





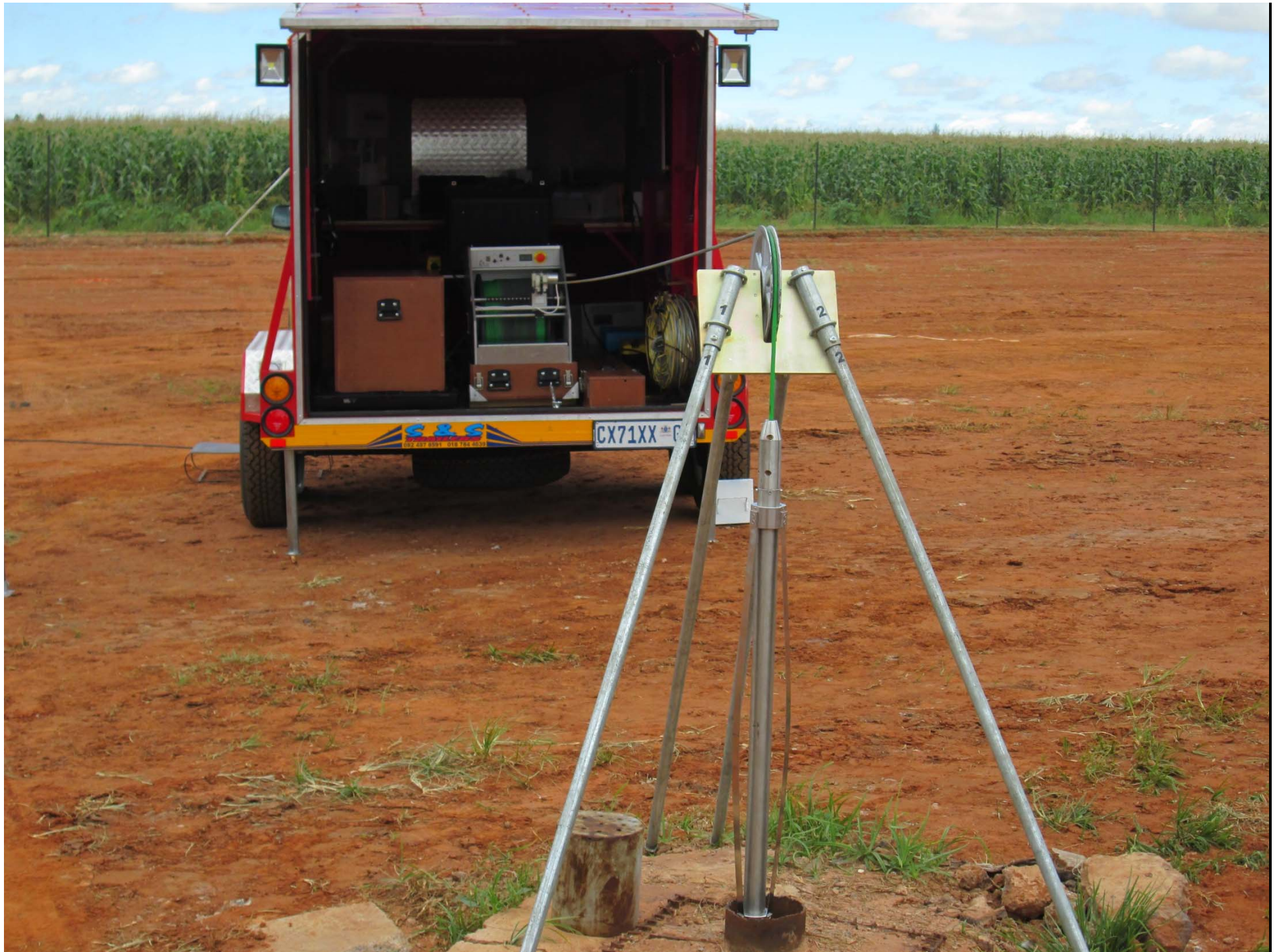


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GC and Bore Hole Camera trailer











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COLLIERY INERTISATION SYSTEM





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COLLIERY INERTISATION SYSTEM







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IN CONCLUSION

- Mines Rescue Services can provide an effective service to all underground mines in South Africa.
- All mines to adhere to the MHSA
- Dependant on
 - The financial support from our member mines
 - Our volunteer rescue team members

