TITLE SLIDE 1

MINES RESCUE SERVICE LTD

"One Step Ahead"

The underground coal industry in Europe has seen a considerable decline in output despite the trend worldwide showing a substantial increase in overall coal production. The UK in particular has seen a decline from some 32 million tonnes deep mined in 1996 to its current level of 16 million tonnes this year, reducing to some 12 million tonnes by 2004. It is an industry therefore, viewed by both Government, owners and employees as declining, with a limited future arising from environmental policies and market restrictions.

The UK in the past has seen the benefits that an indigenous coal industry can bring to the economic development of a country and we see this well demonstrated today elsewhere throughout the world. However, there is a significant cost associated with this economic success, that related to mine accidents, associated social problems and an apparent risk of high mortality rates in the industry. Even in a mature and declining underground coal industry as exists in the UK, it would be a brave person to suggest there is no requirement for the existence of a Mines Rescue Service.

The history of coal mining is littered with evidence of the need for a Rescue Service. *(PHOTOS 2 + 3 – MICHAEL COLL. FIRE 1966 – 9 died, 2 bodies were never recovered – nil production for 6 weeks).*

In the UK, preparations for a mine emergency have been a central component of mine operational management for many years. These may be summed up as:- *(SLIDE 4)*

- arrangements for self-rescue
- an emergency organisation or plan
- availability of secondary rescue teams – a Mines Rescue Service

You may assume that these measures are obvious and, of course, that they are available, fully operational and will work in the event of an incident. However, history suggests otherwise. Many contend that the National Coal Board/British Coal style mine emergency plan arrangements were adequate and an example to others. There is no doubt that lives were saved and incidents were contained, but could more have been done? *(PHOTO 5)* More recent non-mining disasters generally, such as the Piper Alpha, Oil Rig Fire, the Herald of Free Enterprise ferry sinking, London's Kings Cross underground escalator fire, the recent St Gotthard tunnel fire when 10 people died, and then mining incidents including the rockbolted roadway collapse at Bilsthorpe Colliery *(PHOTO 6)* in Nottingham in 1993, Moira No 2 mine explosion in Queensland in 1994 when 11 died, and the Westray mine, Canada explosion 1992 when 26 died, all contributed to a re-appraisal of safety management by industry in general and the legislature of the countries concerned. The roles and responsibilities for the management of safety, the assessment of risk, the management of that risk, and the identification of viable and practised emergency escape and rescue provisions have all been re-examined. Underground mining has also had to be included in this re-appraisal of methods of working.

The past 10 years have seen considerable change in the organisation and ownership of coal mines in the UK. Privatisation in 1994 has resulted in all mines being owned by mining companies and they have the overall responsibility for emergency organisation, including the provision of secondary rescue at their own mines. As owners strive for efficiency in their mines, there is inevitably pressure on secondary rescue services to examine the need for their continuing role as an emergency response provider. In some parts of the world, the emergency response is now primarily provided by the mine or mining company itself. Others are funded by the State or Government. There is no Government role or money available for a mines rescue service in the UK.

What I intend doing in this Paper is to –

- briefly remind ourselves of why the UK mining industry needed and created a mines rescue service and why a mines rescue organisation remains today
- briefly describe some incidents that have occurred since Mines Rescue Service Ltd was formed
- Mines Rescue the future, staying One Step Ahead

THE MINES RESCUE SERVICE

(SLIDE 7)

By far the largest proportion of fatalities associated with coal mines has been, and still is, attributed to falls of ground. Underground explosions and fires represent one other major hazard and these, in particular, tend to generate the most anxiety when they occur, both in the mineworkers themselves and the general public. Fortunately, today, they are the exception, though fires and ignitions of methane gas still occur. In the UK there has already been more underground fires reported in the first six month period of 2003 than in the whole of last year and obviously this is giving cause for concern. *(SLIDE 8)* We are aware that major incidents still occur worldwide arising from fires/explosions underground.

(SLIDE 9) Fortunately, the UK does not have the same severity of underground incidents, but the potential remains.

The Mines Rescue Service primary role has remained unchanged since its fragmented formation by the many mine owners 100 years ago. The role then was to undertake rescue work in a poisonous or irrespirable atmosphere by utilising breathing apparatus. This is still the primary reason for the UK Mines Rescue Service.

(SLIDE 10) **HOUGHTON 1913**

This shows a Mines Rescue Station in 1913 near Durham in the North East of England where there were many mine disasters. This Station is still in use today but only covers two coal mines, a Potash Mine and a Gypsum Mine.

(SLIDE 11) **HOUGHTON TODAY**

Today, a total of 6 such Stations remain a far cry from 1947, when there were 36 such Stations.

(SLIDE 12)

The legislation of the past 50 years surrounding the need for a rescue organisation was designed around the background of a very large state owned industry, the National Coal Board. It is not surprising that the current legislation – Escape and Rescue from Mines Regulations – were introduced in 1995, specifically to cater for a newly privatised industry with multiple owners.

Breathing Apparatus

I have mentioned that the primary role of the Mines Rescue Service is to provide a capability to operate in an irrespirable atmosphere. The availability of suitable Breathing Apparatus and other associated rescue equipment has been crucial in this respect. The development of such apparatus has been well documented elsewhere and I do not propose to go through that here.

I do, however, have some photographs indicating the progression of development up to the present time which you may find of interest *(PHOTOS 13, 14 –1907 W E Garforth)*.

(PHOTOS 15, 16, 17, 18, 19, 20, 21, 22, 23 (SEFA))

The claimed operational duration of modern SCBA may vary with the manufacturer's rating, but will depend upon workload, heat and humidity, fitness etc. Approximately 2 hours is seen as the norm but inevitably, it is the duration of the wearer rather than the apparatus that must be considered.

UK Mines Rescue utilise the Sabre SEFA developed by British Coal, who subsequently purchased some 450 sets during 1985. A few are still in use worldwide but spares are a problem. We maintain some 150 sets only and are currently seeking to purchase a replacement.

The relatively new Dräger BG4, supposedly rated 4hours, is now the only Approved set available for purchase in Europe and it is our intention to re-equip with the BG4 within the next 6 months.

WHY DO WE STILL HAVE A MINES RESCUE SERVICE?

Privatisation

The provision of a national mines rescue service was a particular objective identified by the UK's Health & Safety Commission as a mandatory recommendation to the Government prior to the privatisation of all British Coal's underground mines. *SLIDE 24 (HSC1993)*

Fundamental objectives were laid down for mines rescue following privatisation:-

- "there must remain the national capability to conduct round-the-clock rescue operations"
- "small and remote coal mines must continue to have access to adequate rescue facilities"
- "the new arrangements must not impose disproportionate costs on small mines"

For many years, British Coal provided the service to smaller mines free of any charge. Privatisation of British Coal, however, meant that the successor companies had an obligation to continue British Coal's commitment to provide rescue cover to other smaller mines. In particular, the legal framework for mines rescue needed to be sufficient to ensure all mines continued to have available to them the highest possible standard of emergency rescue cover.

During 1994, events progressed to the formation of the system for mines rescue still operating today.

The new Escape and Rescue from Mines Regulations 1995 came into force in December 1995. During 1995, all owners of coal mines were consulted on the arrangements they wished to have

in place in order to satisfy their obligations under these new Regulations. Without exception, all wanted a national mines rescue service and all agreed the current arrangements:

- maintain the existing high standards of rescue provision
- command the confidence of all who worked in the industry
- ensure the preservation of a national mines rescue capability
- ensure that small and remote mines have access to rescue services
- avoid disproportionate cost burdens on small mines

(PHOTO 25 - Map showing stations)

In January 1996, a company "Mines Rescue Service Ltd" was formed into which all the property (6 stations), rights and liabilities of British Coal's mines rescue service were transferred by a "Restructuring Scheme" made by the Government. Also included were the Emergency Mobile Winders. This transfer took effect on 30 March 1996. *(PHOTO 26 – EMW photo @ Thorne)* There has been no involvement by Government in the affairs of Mines Rescue since that time.

Mines Rescue Service Ltd, a company limited by guarantee and not having a share capital, has since provided the underground coal mines with an effective mines rescue emergency response capability and training facility for all underground coal mines under a Mines Rescue Scheme arrangement which effectively binds together all mine owners. Membership fees are paid to retain Scheme membership and are paid at a rate per tonne of output produced at the mines of members. This rate per tonne is fixed by a Board of Directors of Mines Rescue Service Ltd. Funding of the new company is the responsibility of the owners of underground coal mines.

That has not changed. The initial fee rate was set at 12p per tonne, today it is 16 p per tonne of coal produced.

SLIDE 27

The table shows the reduction in deep mine output, year on year except for this year, which shows a small increase. The deficit between owners' fees and the costs of maintaining a rescue service is covered by work undertaken in other industries. This includes the provision of a service to non-coal mines – potash, rock salt, gypsum and limestone mines, and other underground storage mines.

Incidents

There have been 19 incidents in the last 6 years which have required the special skills of mines rescue teams. Some of the incidents were of long duration, requiring considerable manpower and support.

1 Thoresby Colliery – October 1995

SLIDE 28

At 0945 hrs on Thursday, 12 October 1995, there was an outburst of oil – water – gas mixture from the face of a JCM development heading some 400m long, working at a depth of 900 metres. Approximately 80 tonnes of coal was ejected violently to a depth of 8 metres from a small fault. Estimates of the oil/water/gas mix were 1600 litres/minute reducing to 700 litres/minute over the next 10 hours. Whilst there were undoubtedly higher than normal levels of methane, subsequent investigations revealed high levels of hydrocarbon gases, and in particular a

gas known as n-hexane. These gases cause disorientation to those exposed, and then unconsciousness.

Most of the heading team managed to leave the heading. Four men stayed at the end of the forcing fan ducting, then decided to "make a run for it". Two of these men managed to get out of the heading with some difficulty by breathing from holes made in the fan tubing. The other two, however, were overcome by the fumes.

SLIDE 29

A 5 man rescue team wearing BA "rushed" into the heading at 1134 hours, 1¾ hours after the incident occurred, having travelled 9 kms by vehicle from Mansfield Station and walked 4.5 km carrying all their equipment in hot and humid conditions. Manriding systems were in the contaminated Return airway and could not be used. They located both men some 300 metres into the heading, fitted revivers and removed them from the heading. During the operation, one of the Brigadesmen collapsed with heat exhaustion and also had to be removed from the heading, though he quickly recovered once in fresh air.

SLIDE 30

Unfortunately, one man had died having collapsed into the wheel rut of an FSV and drowned in the water/oil mix. The other rescued man recovered later in hospital. Subsequent investigation of the entire incident included recommendation to rescue procedures, clothing and equipment. In particular, mines are now required to have all Emergency Plans updated with environmental information and available to Rescue Teams, particularly temperature and humidity readings in headings.

(SLIDE 31)

3 Explosions

Potentially, the most serious incident we have been involved in occurred in April 1998 at Prince of Wales Colliery in Yorkshire. A salvage district, H124s, was in the process of being sealed off with signs of an increasing heating in the district was being picked up on the monitoring equipment. Unfortunately, this coincided with a very rapid fall in the Barometer.

H124s retreat face had been prematurely stopped due to faulting. There had been a delay in the face salvage being completed. In March 1998, there had been a slight increase in the CO from the district and every effort was made to seal off the face. Stoppings in both gates were well advanced by the evening of Thursday, 2 April. The Maingate stopping was almost complete, requiring only the Access tube to be sealed. Men were completing the Return Gate stopping. *(SLIDE 32)* The barometer, which had been falling over the past 24 hours, was now almost at 975 MB. The Official in charge, noting an increase in methane at the Return stopping, where the men were working withdrew the men to a position just outbye the gate entrance. He himself was still in the tailgate at 0130 hrs when an explosion of methane gas occurred behind the almost complete stopping. The access tube acted like a gun barrel and threw the Official off his feet. He was badly shaken but not injured. No others were injured by the blast.

(SLIDE 33)

A total of 140 men were underground at the time, with 69 persons inbye of the explosion site, working on 2 Retreat faces and 5 Development headings. All felt the blast and left their districts, all wearing filter self rescuers for at least part of the journey out to fresh air – some 4000 metres.

The mine's emergency organisation was initiated 4 minutes after the explosion and a mines rescue team was at the mine 35 minutes after the explosion. By 0300 hrs – 90 minutes after the explosion – 5 Rescue Teams were in attendance with some underground to monitor the evacuation of the mine.

A Fresh Air Base was established some 900 metres from the site. All mine personnel were accounted for. At 0730 hrs, a second explosion took place at the same site just as a team were assembling to gather information. The Teams withdrew a further 400 metres to another FAB. The mine's tube bundle system was providing valuable information albeit with a delay factor, supplemented by certain electronic sensors that were not "poisoned" by the initial flush of CO.
SLIDE 34

During the next 48 hours, teams were changed continuously underground whilst progress was made towards sealing off the district. This was eventually accomplished, using Breathing Apparatus, and with the help of Nitrogen being pumped in from the surface.
(SLIDES 35, 36, 37, 38)

The entire operation lasted some 78 hours and involved 102 rescue workers, some attending several times. A total of 133 BA were carried with 82 Brigadesmen required to use their BA at some stage of the operation.

This was the longest duration incident requiring the use of Rescue Brigadesmen wearing Breathing Apparatus for some 15 years. More notable, it was the first major explosion at a coal mine since 1993. It demonstrates that such incidents can still happen.

THE FUTURE

(SLIDE 39)

And what of the future?

Indeed, you might say – what is the future for underground mining in the UK, because its future will determine that of the Mines Rescue Service! I hope not! We intend to play a leading part in any discussions regarding our future.

Mines Rescue Service Ltd is now a leading provider of health and safety training to industry in general including the underground mining industry. The finance raised in this way accounts for almost 50% of our gross costs which, in turn, has reduced our costs to the coal industry and has enabled us to invest in new equipment, new vehicles etc. We are also one of the main companies in the UK involved in mine health and safety research, working with partners in Germany, France, Spain and Portugal, and hopefully soon, the new European partners.

We have been extremely successful with our work in other industries, and we can continue to improve. The management of safety in the coal industry is much admired by others, and we have created a 'hands on' approach to training which is somewhat unique. The following indicates some of our work:

British Airways *SLIDES 40-42*

Northumbria Water *SLIDES 43-44*

You may ask "how can you undertake this work and still provide an emergency rescue cover to underground mines?"

(SLIDE 45)

The answer, of course, is that we have proved that we can, in the best possible way. As I said earlier, there have been 19 incidents in the last 6 years requiring our attendance. We have not been found wanting in any respect. We are still there when wanted and normally first on site! Our people are now better qualified, more experienced and more professionally aware and confident because of this other work. The mining industry can only benefit. It is our intention to try and stay "one step ahead" of mine closures that will impact on our future and therefore prevent the unemployment of those who work for Mines Rescue.