40 YEARS of HBL CENTRAL MINING RESCUE STATION SERVICES

I FRENCH REGULATION about RESCUE SERVICE in MINES

In France, extraction of flammable minerals was enforced by the Act dated 29 May 1929, modified on 19th August 1936 and then a General Regulation for winning Coal Mines dated 4th May 1951, itself modified since 1980.

This regulation enforces:

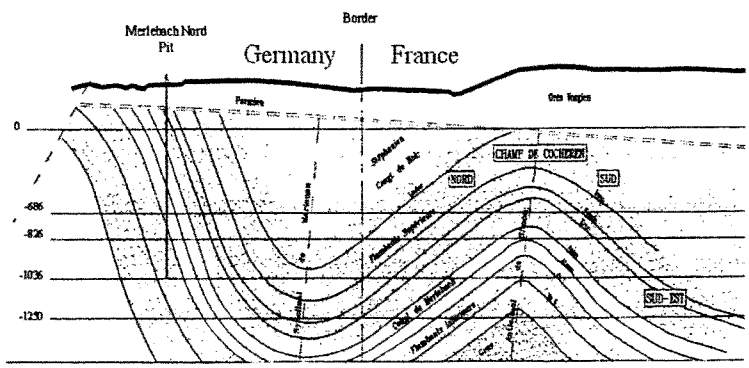
- Art 320: A Rescue Station should be available at every coal mine, where more than hundred miners are working at the same time.
  This station should be provided with breathing apparatus, more than one hour capacity, and with CO sensors.
- Art 321: Organisation, training procedures for rescuers and maintenance of breathing apparatus have to be forecast through a special regulation.
- Art 322: In some large coal field, Central Mining Rescue Station should be created.

Then a special " Ministerial Decision" dated 14th April 1965 enforces HBL to create a " Central Mining Rescue Station" which organisation is to be managed with the local Mining authority.

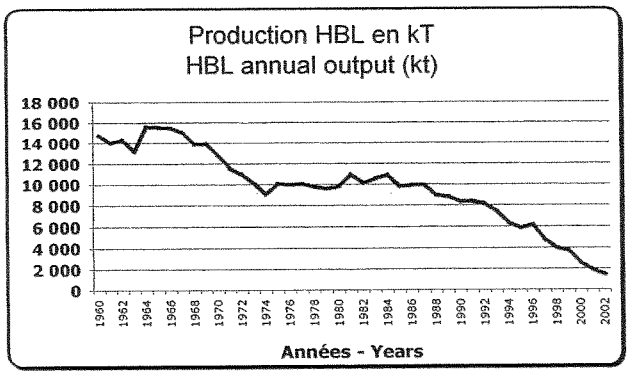
II PRESENTATION of HBL Central Mining Rescue Station

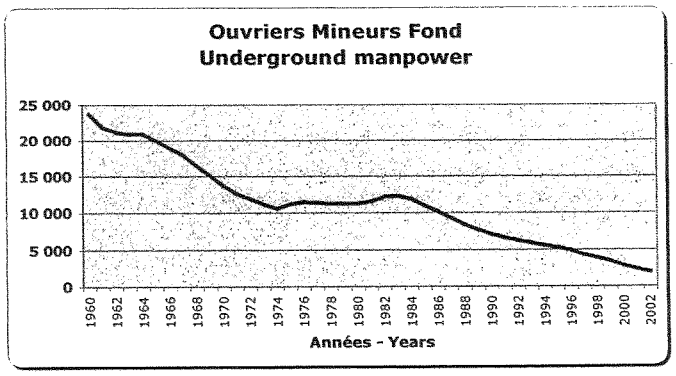
Houillères du Bassin de Lorraine (HBL) is a state owned coal mining company created in 1946 to operate coal mines in Lorraine Coal Field.

Lorraine Coal field located in the eastern part of France, near the German border is the main coal deposit in France. It is a dense deposit sharply folded along two parallel axis resulting in varied types of workings from steep seams (60 to 90°) to flat seams (8 to 30°).



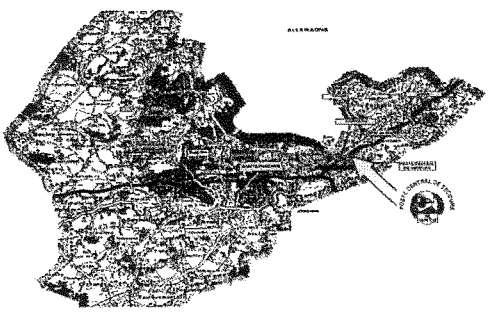
Maximal coal production in this area was slightly more than 15 million tons a year through 8 winning pits. Maximum of employees was more than 40 000 including 26 000 underground miners.

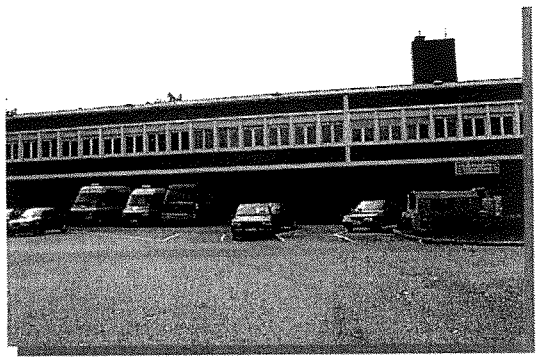




Nowadays, coal winning will be over in HBL by the early beginning of 2004. The 2002 coal production was only 1 483 000 tons wined in two longwall faces distributed into two pits (Merlebach and La Houve) thanks the contribution of less than 2000 miners (exactly 1893). In the year 1960, i.e 5 years before it becomes compulsory for HBL, a Central Mining Rescue Station was created in a new building located at Freyming Merlebach, well situated at the centre of the Lorraine coal field.

In such a way, thanks to a nice roadway network, twinned with a highway a few years later, it was possible to reach every winning pit in less than 15 minutes.





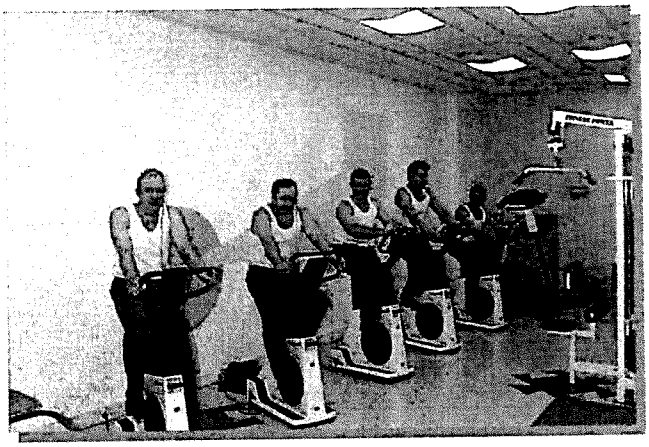
III The Central Mining Rescue Station Building

Central Mining Rescue station building covers 1 120 m^2, and is distributed into three levels.

Basement:

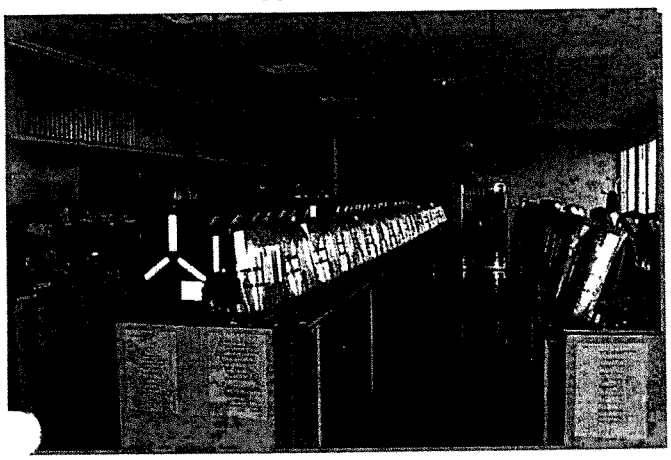
- large training room, with obstacles requiring to crawl through 1000 mm diameter ducting and 60 cm height areas, to climb 20m of vertical ladders, to walk in bended position to set then remove equipment such pipes,... All training are realised with breathing apparatus assistance (BG 174 or BG 4 EP) as the atmosphere is maintained in poor visibility and harsh climatic conditions (35°C),
- a fitness centre with a sauna,

- some storage area with specialised equipment for underground operations (trapped miners detectors,...).



Ground Floor:

- large garage for two operation vans specially equiped for the transportation of 10 rescuers and their equipment,
- workshops for maintenance of vehicles and operating equipment (methanometre, chemical self rescuers,....),
- workshop for the filling of breathing apparatus,
- some offices.



First floor:

- offices,
- welfare facilities, such as a kitchen, dinning room, rest room, bed rooms,
- conference rooms,
- workshops for maintenance and storage of breathing apparatus,
- laundry.

IV CENTRAL MINING RESCUE STATION ORGANISATION

The organisation of HBL Central Mining Rescue Station jointly agreed with the local Mining Authority is summarise as follow:

Rescue men:

They are all volunteers, below the age of 42, and medically controlled every year, with a special capacity for working in harsh conditions.

Each gang is of 4 miners and one overman who is the team manager.

Training:

The initial training is 10 days long, including First Aid, ventilation rules, atmosphere controls and use of special equipment in fire fighting operations, supporting in case of roof collapse, working under breathing apparatus assistance.

Then every year, 5 days training are organised for every rescue men. This training includes 3 exercises in the special chamber of the Central Mining Rescue station and 2 exercises in underground conditions.

Duty:

Every working days, two gangs (10 rescue men) are on duty round along the clock at the Central Station, following a monthly program.

In case of emergency, as soon as the gangs on duty are mobilised for an operation, thanks to a dedicated telephone network it is possible to call new rescue men in order to establish 2 new duty gangs at the Station. Experience shows that on working days, a reserve is available with less than one hour.

During free days there is no duty gangs at the station, but as 60 rescue men are provided with special telephone arrangement, experience shows that in less than one hour it was possible to gather two gangs ready for the intervention.

Liability:

Liability of Central Mining Rescue Station officers is to maintain the Station in proper operative conditions. In such a way, rescue men have to be permanently available, well trained and equipped with the up to date material.

By the time of the operation, rescue gangs are under the responsibility of the General Manager of the mine and Rescue Station officers are included in the crisis staff to check the underground workings conditions and to give some advice in the management of the operation.

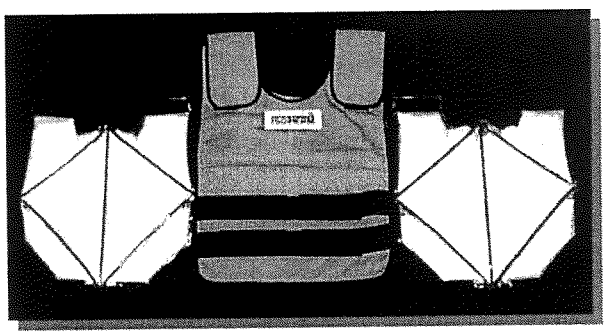
V RESCUE MEN EQUIPMENT

Flame proof protection suit:

As most of the time, gangs have to work in flammable conditions, rescuers are wearing NOMEX underwear and suit in order to be protected for a short time against effect of a flame. A special cover like a penitent's hood is provided to cover the helmet for a total protection of the rescuer.

Cooling Jacket:

In case of long duration working in harsh condition rescuers are also wearing special cooling jacket which provides a nice refreshment of the human body and allows longer working time in best conditions. However atmosphere characteristic such as dry and wet temperature, air velocity have to be checked regularly to determine the maximum working time allowed in every case.



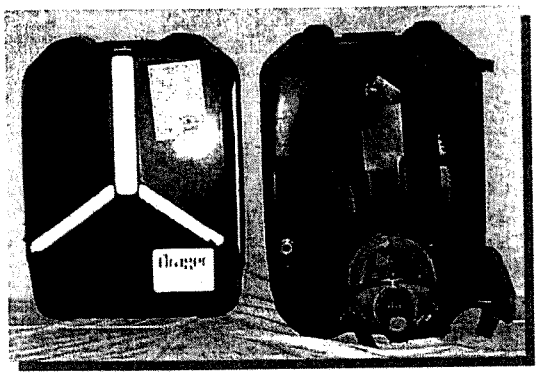
Breathing apparatus:

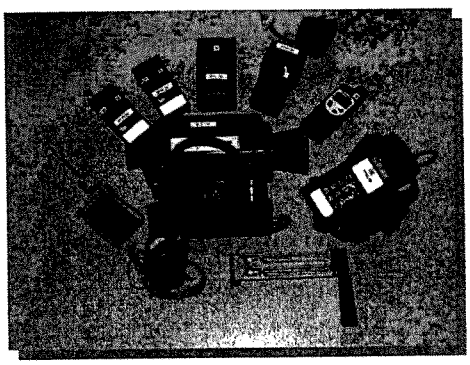
Breathing apparatus used underground are always closed circuit type, with 4 hours capacity. HBL Central Rescue Station is equipped with Draëger BG 174 (140 pieces) fitted with a cooling box and BG 4 EP (46 units).

BG 4 EP is more comfortable and lighter than BG 174 which is a very positive point in every conditions and specially if cooling jacket is also required.

Atmosphere detectors:

Gang has to be protected thanks a frequent and good knowledge of the environment as most of the time atmosphere should be explosive.
Draëger explosimetre type Mini Warn is commonly used by the team captain as other apparatus to check temperature and humidity.





Self Rescuers:

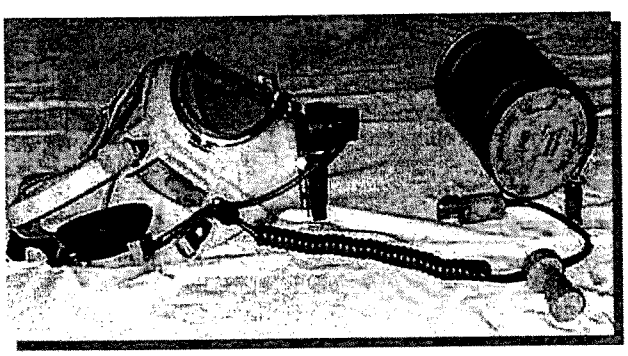
In addition of the Draëger breathing apparatus, every rescue man is also wearing a chemical Self Rescuer Fenzy Biocell.

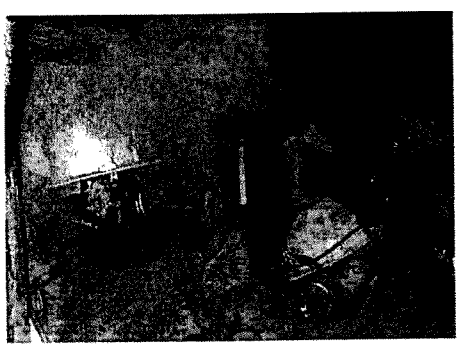
Communication :

For communication with the base point established in a safer area rescue gangs are using a "genephone" network with a lost cable roll. Used of this genephone associated with the genephonic mask worn by the team captain is very reliable and greatly facilitated thanks the use of new material in the mask design.

Lighting sticks :

In some scarce circumstances the gang must be provided with some lighting sticks, in order to light up the working place if required. These sticks are providing a coloured light to ease visibility of the rescuers.





VI OPERATIONS OF THESE LAST 42 YEARS

Since the creation of the Central Mining Rescue Station in 1960, gangs intervened at 114 times in crisis situations.

Out of these 114 operations, 44 were due to collapsing, 20 due to fire of very small volume and 47 due to spontaneous combustion or gas ignition with unbreathable atmosphere and time to time very poor visibility.

The remaining 3 operations were conducted in the spot of co-operation with Civil Rescue operation.

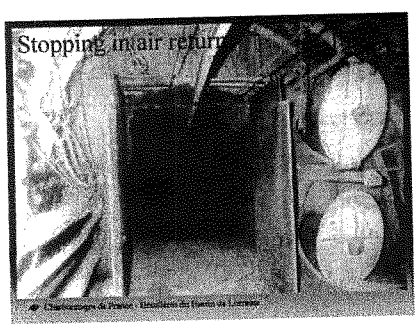
First time in 1967 to search 2 children lost in underground galeries near a medieval castle, second time in 1982 to search survivals after the explosion of a corn bunker and the last one in september 2002 in a potash mine to extinguish a fire in an underground storage area.

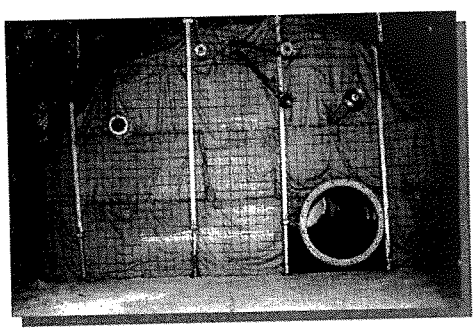
Along these 42 years, Central Mining Rescue people faced one big disaster on 30th September 1976 when 10 rescue men and 6 miners were killed in an explosion initiated by spontaneous combustion in a steep steam face. Fight against this event was very hard and take three weeks time. For the first time it was considered as too dangerous to try to recover the bodies of the died people and the galerie was filled with hydraulic stowing. They are always resting in this roadway, 1036 m under the surface.

Nowadays, most of Central Mining Rescue interventions are not crisis operations but mainly assistance to the mines for some special workings. As in HBL faces we are using nitrogen as choking gas associated with fast closing doors, time to time we isolate district and then reopen it before resuming coal winning. In such circumstances, rescue gangs are on the spot to secure the operation, which is in fact also a good training for them.

VII IMPLICATION IN CECA'S RESEARCHES

Since 1960, the HBL Central Mining Rescue Station was also involved in a few CECA (European community for Coal and Steel) researches, such as design of chemical self rescuer, establishment of escape policy including the use of a dedicated telephone network, self rescuers and pressurised shelters. Special kits for the fast building of stopping were also designed in the spot of these studies.
In the scope of detection for trapped miners, in the 1970's, a special methodology using seismic sensors for long distance location, then drilling of 600 mm boreholes for rescuing of trapped miners was developed in association with Germany. In 2001, the location system was up dated, despite we never had to use it.





VIII THE FUTURE

Coal mining in France is decreasing very quickly and HBL which is the last mining operator in France will stop it's mining activity by the beginning of next year 2004.

In such a way, risks linked to coal mining will be reduced and it is not compulsory to keep a Central Mining Rescue Station as a HBL specialised service. Nevertheless the HBL Rescue Service will be reorganised through two professional gangs ensuring a two shifts a day duty for one or two years more, before disappearing with the whole company.

Our aim is that the HBL Rescue structure, competence, experience and equipment will be integrated in a Civil Rescue Body in order to continue rescue operations in case of underground accidents. For this purpose a special agreement was signed between Interior Ministry through Civil Rescue Service and HBL in 1997 to create a special Rescue Body including rescue men from HBL and specially trained firemen. According to this agreement, more and more firemen are trained every year in HBL Central Mining Rescue Station, and common exercises are done to increase tunnels protection. It is also in the view of this Rescue Body that in September 2002, HBL rescue gangs operate in a potash mine, 250km from HBL.