

COMMISSION OF THE EUROPEAN COMMUNITIES

Safety and health commission for the mining
and other extractive industries

**18th REPORT
of the safety and health commission
for the mining
and other extractive industries**

YEAR 1980

LUXEMBOURG - FEBRUARY 1981

FOR OFFICIAL USE ONLY

COMMISSION OF THE EUROPEAN COMMUNITIES

Safety and health commission for the mining
and other extractive industries

**18th REPORT
of the safety and health commission
for the mining
and other extractive industries**

YEAR 1980

LUXEMBOURG - FEBRUARY 1981

CONTENTS

	page
SECTION I	7
Coal mining activities	9
General activities of the Safety and Health Commission	17
SECTION II	
ACTIVITIES OF THE WORKING PARTIES	29
Chapter A - Rescue arrangements, mine fires and underground combustion	31
B - Winding ropes and shaft guides, winding engines and winches	35
C - Electricity	39
D - Flammable dusts	43
E - Common accident statistics	45
F - Health in mines	47
G - Human factors affecting safety	49
H - Ventilation, firedamp and other mine gases	51
I - Mechanization	53
J - Strata control and stability of ground	55
K - Oil, gas and other materials extracted by borehole .	59
SECTION III	
COMMON ACCIDENT STATISTICS	61
SECTION IV	
STATISTICAL TABLES FOR THE EXTRACTIVE INDUSTRIES OTHER THAN THE COAL INDUSTRY	109
ANNEXES	149

LIST OF ANNEXES

	page
I. Terms of reference and rules of procedure of the Safety and Health Commission for the mining and other extractive industries	151
II. Terms of reference of the various working parties of the Safety and Health Commission	163
III. Composition of the Safety and Health Commission, the restricted Committee and the Working Parties	181
IV. Studies completed during the last five years	189

SECTION I

COAL MINING ACTIVITIES IN 1980

- 1.1. The statistics given below are drawn from the EUROSTAT statistical telegram dated 22 January 1981 (provisional data) and from information supplied by the national mining authorities.
- 1.1.1. The main feature of Community coal mining activities in 1980 was an increase of 8.4 million tonnes (Mt) in production, which thus returned to the 1976 level of 247.15 Mt.
- This rise of 3.5 % for the Community as a whole was particularly marked in Germany, Belgium and above all the United Kingdom, where it amounted to 6.2 %.
 - There was also an increase of 14.5 Mt in imports, which thus stood at 73.8 Mt or 23 % of total supply.
 - Coal consumption did not go up, however, as the increase in power stations' consumption was offset by a drop in that of coking plants.
 - As a result, there was a rise in stocks held at pitheads, where they represented 14.7 % of annual production, and by consumers. Mines stocked more than their increase in production (approximately 10 Mt).
 - The number of underground workers on the books went up slightly (+ 0.1 %) as a result of an increase of 2600 in Germany, which was offset to some extent by the decline in France (- 1200), Belgium (- 700) and the United Kingdom (- 200). It should be noted, however, that this slight increase follows a steady decline in the number of underground workers over a period of many years.
 - Output per man-hour showed a slight increase of 1 % despite a drop of 1.3 % in Germany, where it is still, however, the highest in the Community (27 % above average).

ERSTE ERGEBNISSE
ZUR LAGE IN DER KOHLENWIRTSCHAFT
FÜR DAS JAHR 1980

(Vorläufige Angaben)

FIRST RESULTS
ON THE COAL INDUSTRY
IN 1980

(Provisional data)

PREMIERS RESULTATS
SUR L'ACTIVITE CHARBONNIERE
EN 1980

(Données provisoires)

	EUR 9	FR Deutschland	France	Italia	Nederland	Belgique België	Luxembourg	United Kingdom	Ireland	Denmark
STEINKOEHLE										
Förderung										
1978	238 111	90 104	19 690	-	-	6 590	-	121 695	32	-
1979	238 748	93 312	18 611	-	-	6 125	-	120 637	63	-
1980	247 150	94 460	18 136	-	-	6 325	-	128 169	60	-
1979/78	+ 0,3%	+ 3,6%	- 5,5%			- 7,1%		- 0,9%	+ 96,9%	
1980/79	+ 3,5%	+ 1,2%	- 2,6%			+ 3,3%		+ 6,2%	- 4,8%	
Beschäftigte unter Tage (Jahresdurchschnitt)										
1979	352,3	119,0	31,6	-	-	17,1	-	184,2	0,4	-
1980	352,8	121,6	30,4	-	-	16,4	-	184,0	0,4	-
1980/79	+ 0,1%	+ 2,2%	- 3,8%			- 4,1%		- 0,1%		
Leistung unter Tage je Mann und Stunde										
1979	421	546	337	-	-	276	-	373	-	-
1980	425	539	352	-	-	279	-	382	-	-
1980/79	+ 1,0%	- 1,3%	+ 4,5%			+ 1,1%		+ 2,4%		
Bestände bei den Zechen (am Jahresende)										
1978	32 071	13 831	4 826	9	-	265	-	13 110	30	-
1979	26 497	12 236	3 836	-	-	190	-	10 245	30	-
1980	(*)36 336	(*)13 200	5 625	-	-	164	-	17 317	30	-
1979/78	- 17,4%	- 11,5%	- 20,5%			- 43,4%		- 21,9%		
1980/79	+ 37,1%	+ 7,9%	+ 46,6%			+ 9,3%		+ 69,0%		
Einfuhr aus Drittländern										
1978	45 335	5 703	15 870	9 849	3 351	2 716	174	2 019	617	5 036
1979	59 344	6 886	19 547	11 180	3 844	5 900	174	4 047	1 077	6 689
1980	73 800	7 400	22 500	13 800	4 900	7 100	200	7 400	1 200	9 300
1979/78	+ 30,9%	+ 20,7%	+ 23,2%	+ 13,5%	+ 14,7%	+ 117,3%		+ 100,3%	+ 74,6%	+ 32,8%
1980/79	+ 24,4%	+ 7,5%	+ 15,1%	+ 23,4%	+ 27,5%	+ 20,3%	+ 14,9%	+ 82,9%	+ 11,4%	+ 39,0%
STEINKOEHLEKOKS										
Erzeugung										
1978	64 132	25 593	10 682	7 315	2 401	5 747	-	12 394	-	-
1979	67 305	26 697	11 615	7 901	2 530	6 451	-	12 511	-	-
1980	66 595	28 540	11 200	8 300	2 450	6 005	-	10 100	-	-
1979/78	+ 4,9%	+ 4,3%	+ 8,7%	+ 2,5%	+ 5,4%	+ 12,3%		+ 0,9%		
1980/79	- 1,1%	+ 6,9%	- 3,6%	+ 10,7%	- 3,2%	- 6,9%		- 19,3%		
Bestände bei den Kokereien (am Jahresende)										
1978	18 823	13 735	1 194	487	35	87	-	3 285	-	-
1979	9 889	6 820	535	422	22	108	-	1 982	-	-
1980	(*)10 582	(*) 6 292	630	550	50	160	-	2 900	-	-
1979/78	- 47,5%	- 50,3%	- 55,2%	- 13,3%	- 37,1%	+ 24,1%		- 39,7%		
1980/79	+ 7,0%	- 7,7%	+ 17,8%	+ 30,3%	+ 127,3%	+ 48,1%		+ 46,3%		

(*) einschliesslich Lager Notgemeinschaft

(*) including German non-collery producer stocks

(*) y compris les stocks producteurs allemands hors mines et cokeries

Steinkohle : 7 260 10³ t
Koks : 2 977 10³ t

Hard coal : 7 260 10³ t
Coke : 2 977 10³ t

Houille : 7 260 10³ t
Coke : 2 977 10³ t

Millionen Tonnen

millions de tonnes

millions de tonnes

	EUR 9	BR Deutsch- land	France	Italia	Nederland	Belgique België	Luxembourg	United Kingdom	Ireland	Danmark
STEINKOHL			HARD COAL					HOUILLE		
Lieferungen an secheneigene und Öffentliche Kraftwerke (*)			Deliveries to public power stations and to pithead power stations (*)					Livraisons aux centrales électriques des services publics et des mines (*)		
1978	154,6	37,4	23,1	2,0	1,1	3,7	-	81,9	0,0	5,4
1979	166,5	39,6	25,2	3,2	1,1	4,6	-	86,3	0,0	6,6
1980	180,8	39,9	26,9	4,9	1,6	6,0	-	92,0	0,1	9,4
1979/78	+ 8%	+ 6%	+ 9%	+ 60%	-	+ 24%		+ 5%	-	+ 22%
1980/79	+ 9%	+ 1%	+ 7%	+ 53%	+ 45%	+ 30%		+ 7%		+ 42%
Lieferungen an die Kokereien			Deliveries to coking plants					Livraisons aux cokeries		
1978	82,6	32,8	13,0	10,0	3,3	7,2	-	16,3	-	-
1979	87,6	34,1	14,5	9,9	3,6	8,5	-	17,1	-	-
1980	87,1	36,6	14,8	11,3	3,4	7,6	-	13,4	-	-
1979/78	+ 6%	+ 4%	+ 12%	- 1%	+ 9%	+ 18%		+ 5%		
1980/79	- 1%	+ 7%	+ 2%	+ 14%	- 6%	- 11%		- 22%		
STEINKOHLKOKS			HARD COKE					COKE DE FOUR		
Lieferungen an die Eisen- und Stahlindustrie			Deliveries to iron and steel industry					Livraisons à l'industrie sidérurgique		
1978	52,3	17,0	10,2	6,5	2,1	5,9	2,0	8,7	-	0,1
1979	58,7	20,0	11,3	6,3	2,5	6,7	2,3	9,5	-	0,1
1980	55,6	19,7	12,0	6,6	2,9	6,2	2,4	5,7	-	0,1
1979/78	+ 12%	+ 18%	+ 11%	- 3%	+ 19%	+ 14%	+ 15%	+ 9%		-
1980/79	- 5%	- 2%	+ 6%	+ 5%	+ 16%	- 7%	+ 4%	- 40%		-

(*) einschliesslich Bergbauverbundkraftwerke
und Bundesbahn
(Bundesrepublik Deutschland)(*) including Bergbauverbundkraftwerke
and Federal railways
(Federal Republic of Germany)(*) y compris les Bergbauverbundkraftwerke
et les chemins de fer fédéraux
(République fédérale d'Allemagne)Inhaltswiedergabe nur mit
Quellenangabe gestattetReproduction is subject to
acknowledgement of the sourceReproduction subordonnée à
l'indication de la source

1.1.2 GENERAL REVIEW OF UNDERGROUND ACCIDENTS IN COAL MINES

This is the fourth year for which this analysis can be presented for the Community of Nine, including the four principal producer countries; the United Kingdom, the Federal Republic of Germany, France and Belgium. The number of hours worked was 564.71 million as compared with 557.13 in the previous year.

- 1.1.2.1 The total number of accidents resulting in more than three days' absence from work, or in death, was 74 102 as against 77 586 in the previous year. The frequency rate (number of persons affected by accidents per million hours worked) was 131.22 as compared with 139.26, or a decrease of 5.77%, statistically significant at 95% confidence level. As is explained below, this decrease is observable in all the categories of accident.
- 1.1.2.2. Accidents resulting in an absence from work of between 4 and 20 days numbered 49 139, a frequency rate of 87.01, representing a decrease of 5.01% as compared with the figure 91.62 for the previous year (a statistically significant difference).
- 1.1.2.3. Accidents resulting in an absence from work of between 21 and 56 days numbered 19 239, giving a frequency rate of 34.06 and representing a decrease of 7.07% compared with the figure of 36.65 for the previous year (a statistically significant difference).
- 1.1.2.4. Accidents resulting in an absence from work of more than 56 days numbered 5 583, a frequency rate of 9.88 and a decrease of 8.18% as compared with the 10.76 for the previous year (a statistically significant difference).
- 1.1.2.5 There were 141 fatal accidents, with one group accident (2 fatalities). The figures for the previous year were 131 fatalities with three group accidents (22 deaths).
The frequency rates were:
- including the group accidents, 0.250, representing an increase of 5.96% over the 0.235 for the previous year. This increase is not significant at a 95% confidence level;

- excluding the group accidents, 0.246, representing an increase of 22.4% over the 0.201 for the previous year (a statistically significant difference).

1.1.2.6 A more detailed analysis, taking account of the figures for the last four years and the main causes of the accidents, may be found in section IV.

1.2. ACTIVITIES OF ALL THE EXTRACTIVE INDUSTRIES

1.2.1. Appended to this report are tables, by country, covering the same items of information as last year. The degree of harmonization is not sufficient to draw up a table at Community level.

- On the front page will be found

a set of minerals considered to be the most suitable for initial comparisons;

- and on the reverse side

a second set, comprising a wider variety of minerals and not standard throughout the Community, which account for a substantial volume or value of production in the country concerned.

1.2.2. The number of sites or companies, production and unit of production are given opposite each product.

1.2.3. A distinction is drawn between three methods of extraction: deep mining, opencast mining and quarrying, by borehole.

Wherever possible, the manpower figures for each of these methods of extraction do not include administrative and commercial staff nor persons employed in mineral processing; they do, however, include workers employed in preparation of the minerals (crushing, concentration, cleaning, loading).

1.3. THE COMMUNITY'S DEPENDENCE ON ENERGY

The figures given in the following table are taken from the Statistical Office of the European Communities' Bulletins on 'Hydrocarbons' of 6 May 1982 and 'Coal' of 19 March 1982.

- 1.3.1 Developments in the coal market have already been discussed in 1.1. There was a substantial rise in production and in imports from third countries.
- 1.3.2. Lignite production was virtually the same as in the previous year.
- 1.3.3. There was a slight increase in petroleum production (1.7%) but the imports of this product fell appreciably (14.6%).
- 1.3.4. Gas production continued to fall (5.7%) in 1980 and imports from third countries rose sharply (11.9%).

COMMUNITY ENERGY PRODUCTION AND IMPORTS (X)

		EUR. 9	D	F	I	NL	B	L	UK	Ir	Dk
Coal in millions of t Production	1977	240,4	91,3	21,3	-	-	7,07	-	120,7	0,05	-
	1978	238,1	90,1	19,7	-	-	6,6	-	121,7	0,03	-
	1979	238,7	93,3	18,6	-	-	6,1	-	120,7	0,06	-
	1980	247,2	94,5	18,1	-	-	6,3	-	128,2	0,07	-
Imports from third countries	1977	46,0	5,6	15,6	12,3	3,8	3,2	0,1	2,1	0,67	4,6
	1978	45,3	5,7	15,9	9,9	3,4	2,7	0,2	2,0	0,62	5,04
	1979	58,2	6,2	19,5	11,3	3,9	5,9	0,2	4,0	0,85	6,5
	1980	73,9	7,3	22,6	14,3	5,0	7,3	2,2	7,2	0,91	9,1
Lignite Production	1977	127,9	122,9	3,1	1,9	-	-	-	-	-	-
	1978	128,2	123,6	2,7	1,9	-	-	-	-	-	-
	1979	135,1	130,6	2,4	2,1	-	-	-	-	-	-
	1980	134,4	129,9	2,6	1,9	-	-	-	-	-	-
Crude oil in millions of t Production	1977	47,2	5,4	1,1	1,1	1,6	-	-	37,5	-	0,5
	1978	62,2	5,1	1,1	1,5	1,5	-	-	52,6	-	0,4
	1979	86,6	4,8	1,2	1,7	1,5	-	-	77,0	-	0,4
	1980	88,1	4,6	1,4	1,8	1,6	-	-	78,4	-	0,3
Imports from third countries	1977	485,1	95,3	115,7	105,4	56,1	35,4	-	68,7	2,2	6,3
	1978	475,5	90,6	114,0	110,4	54,1	32,7	-	66,3	2,2	5,2
	1979	486,3	97,3	123,0	114,7	52,9	33,1	-	57,9	2,2	5,2
	1980	415,2	89,1	110,7	92,2	46,0	31,5	-	44,5	1,9	4,3
Natural gas in 1000 Terajoules (gcv)(xx) Production	1977	6491,5	673,0	298,5	526,1	3407,4	1,3	-	1584,8	-	-
	1978	6192,6	719,9	307,1	526,0	3120,2	1,3	-	1517,6	0,4	-
	1979	6375,8	741,9	301,5	500,0	3308,8	1,3	-	1498,0	24,3	-
	1980	6008,7	662,9	294,2	477,3	3101,6	1,5	-	1436,9	34,3	-
Imports from third countries	1977	802,2	232,8	123,6	354,9	10,2	10,3	-	70,4	-	-
	1978	1410,8	505,5	185,8	403,4	61,9	54,9	-	199,3	-	-
	1979	1735,7	615,3	199,5	395,5	98,4	80,0	-	347,0	-	-
	1980	1970,3	719,8	318,6	294,6	133,2	85,5	-	418,6	-	-

(x) Taken from Eurostat publications of 19 March 1982 and 6 May 1982.

(xx) At 35.17 megajoules/m³ 0° 1.01 bar, 1 000 terajoules = 28.4 x 10⁶m³.

GENERAL ACTIVITIES OF THE SAFETY AND HEALTH COMMISSION

1. Meetings held.

The Safety and Health Commission held three plenary sessions, on 26 March, 7 May and 23 October 1980 respectively, preparatory meetings of the Restricted Committee being held on the previous days.

The Restricted Committee held an additional meeting on 3 October 1980 in order to draw up a programme of action and establish a working procedure for the years ahead.

The Working Parties held 13 meetings which were prepared by committees of experts.

The Working Party 'Winding Ropes and Shaft Guides, Winding Engines and Winches' held a meeting outside Luxembourg.

An information symposium was held on 13 and 14 May 1980 and another on 9 and 10 October 1980, the first being intended for engineers from the extractive industries and the second being an international symposium on deep-sea diving, particularly the technical and human aspects.

2. Group accidents.

Only one group accident as usually defined occurred in 1980: firedamp ignition on 16 September 1980 at the Warndt mine in the Saar district resulting in two fatalities and 16 people being badly burned.

The Safety and Health Commission examined reports on the following accidents.

- Accident at the Golborne Colliery (near Manchester, UK) on 18 March 1979 (Doc. No 2031/80)

A firedamp explosion resulted in the death of 10 miners: 3 were killed instantly and seven of the eight seriously injured later died of their injuries.

On 23 October 1980, the Safety and Health Commission decided that the Working Parties 'Electricity' and 'Ventilation, Firedamp and Other Mine Gases' would analyse the findings on this accident and submit proposals to the national governments.

- Accident at the Hansa Colliery (Dortmund, Germany) on 22 March 1979

An explosion resulted in seven fatalities.

The interim report has been received and the Safety and Health Commission will examine the findings once the final report is available.

- Accident at the Bentley Colliery (South Yorkshire, UK) on 21 November 1978 (Doc. No 2032/80)

Seven people were killed and three seriously injured when a train was derailed underground.

The Safety and Health Commission decided on 23 October 1980 that the Working Party on Mechanization would examine the problems raised by the report.

- Accident at the Haus Aden Colliery (Bergkamen, near Dortmund, Germany) on 15 February 1979 (Doc. No 2495/80)

Five people were killed following a rockburst in a rise heading.

The Working Party on Strata Control and Stability of Ground examined the problem of rockbursts at the request of the Safety and Health Commission and drew up a preliminary report which is referred to in § 3 below.

Although it did not occur on the territory of a Member State, mention must be made of the group accident which occurred on 27 March 1980 on the Alexander Kielland platform in the Ekofisk field situated in Norwegian waters.

While the anchor chains of this dormitory platform were being adjusted in order to move it back from the drilling platform because of bad weather, one of its floating supports came loose and the platform turned over completely in a very short time. Because of the very sudden tilting of the structure, not all the personnel on board could get out and 123 people died. The final report on this accident, which is not yet available, will warrant in-depth analysis.

The disaster made a deep impression on public opinion and raised a large number of problems concerning safety on which attention should be focussed and which the Safety and Health Commission will analyze through the intermediary of its Working Parties.

3. Decisions of the Safety and Health Commission.

The following were approved in 1980.

- Proposal to governments on dust neutralization by calcareous dusts in the underground workings of coalmines (meeting of 25 March 1980 - Doc. No 3419/9/77).
- Report on 'Practical Steps to reduce the risk of rockbursts' used in the various countries (meeting of 23 October 1980 - Doc. No 3888/9/77).
- Report on 'Health and Safety problems in connection with the use of diesel engines in underground mines and quarries' (meeting of 23 October 1980 - Doc. No 4706/76).

- Report on the Merlebach (30 September 1976) and Schlängel und Eisen (27 October 1977) accidents (meeting of 7 May 1980 - Doc. No 5983/8/78). Although it was not approved until 1980, this report is annexed to the 17th Report (1979) of the Safety and Health Commission.
- Safety and Health Commission proposal to governments on 'Well control exercises and training of the responsible personnel' (meeting of 7 May 1980 - Doc. No 2275/3/79). This proposal is also annexed to the 17th Report.
- Safety and Health Commission proposal to governments on 'Guidelines for the design and testing of chemical oxygen self-rescuers' (meeting of 7 May 1980 - Doc. No 4936/8/78).

4. Symposium for mining engineers with a view to improving working conditions in underground mines (13 and 14 May 1980).

The symposium in Luxembourg was attended by about 150 people, including mining engineers from the industry and the inspectorates as well as representatives of the Safety and Health Commission.

As the title suggests, the discussions centred on the human aspects of work rather than the technical aspects usually tackled.

Industrial medicine, ergonomics, and appropriately coordinated projects to improve working conditions were discussed. Ways and means of making the personnel more safety-conscious were also examined.

In addition, technical achievements as regards improvement of climate and lighting in mines, reduction of noise and vibrations, and making certain tasks less arduous, were reviewed.

The findings of the symposium have been incorporated into the

programmes of the Working Parties 'Human Factors affecting Safety' and 'Health in Mines'.

5. International symposium on deep-sea diving.

The Secretariat of the Safety and Health Commission and the European Diving Technology Committee (EDTC) organized an international symposium on the technical and human aspects of deep-sea diving. This symposium, which was held in Luxembourg on 9 and 10 October 1980 and attended by 230 experts from 20 countries, was the follow-up to a congress held in October 1978 on the medical aspects of diving accidents.

Contributions concerned the causes of diving accidents, the training of divers, and research and development of new techniques, for divers were required to work in increasingly deeper waters and in arduous conditions. In this last connection, the use of long-range autonomous submersible vehicles was advocated, either to replace the diver or to provide him with an operating base for excursions, rather than having to go down from bells linked to a surface tender.

The report of proceedings of the symposium is obtainable from the Secretariat of the Safety and Health Commission upon request.

6. Safety campaigns.

Following up steps taken in previous years (see the 17th report of the Safety and Health Commission), it was decided to organize two safety campaigns to be financed under the 1980 budget. They will take place in 1981 in coal mines, one in Germany on the theme 'Handling of heavy loads', the other in Belgium on the theme 'Improvement of

posture and movement during handling, setting and removal of props and bars at faces and face ends'.

These subjects are particularly well chosen in the context of preventing individual accidents during hazardous operations.

The lifting, transport and handling of loads in a confined space such as a mine working is always a major source of concern to safety officers.

Two further themes to be tackled in 1982, in France and in the UK, will be decided upon at the beginning of 1981.

In 1980, a safety campaign was completed in the marble quarries in the Tuscany region of Italy; the results were highly satisfactory and it is probable that this work will be used in other districts.

7. Organization of the Safety and Health Commission and its Working Parties.

At its meeting of 7 September 1979, the Safety and Health Commission reviewed and updated the terms of reference of the Working Parties.

While accepting these terms of reference, the Restricted Committee on 3 October 1980 put forward several proposals concerning the organization of these groups rather than the terms of reference as such. These proposals were adopted by the Safety and Health Commission on 23 October 1980. It was necessary to take account of the budgetary, material and human constraints involved. As the means available are limited, rationalization is called for whenever possible and priorities must be judiciously allocated to the subjects chosen.

Points to emerge from the debate were that:

- there was a need for continuity in the activities of the Safety and Health Commission;

- the extension of the Safety and Health Commission's overall responsibility to all the mines and extracting industries entailed new obligations and an effort therefore had to be made to incorporate the problems specific to these industries into the activities of the existing working parties;
- the Working Party on Health in Mines should be reactivated on a regular basis for the Working Party on Human Factors Affecting Safety; a new programme would be formulated within the Terms of Reference;
- select groups of experts would be called upon to carry out clearly defined studies for subsequent submission to the existing working parties. These small groups would be established for a specific purpose and for a limited period of time.

8. Studies.

The studies selected and undertaken in 1980 in the context of the activities of the Safety and Health Commission's Working Parties are as follows:

- Effectiveness of check testing of the fire resistance of conveyor belts (rapporteur : Mr W. Robertson)
- Safety of monorails in mines (Seilprüfstelle - Bochum)
- Safety of shearer haulage and armoured conveyor chains in mines (Westfälische Berggewerkschaftskasse - Bochum)
- Preventative measures to be taken against instantaneous outbursts of methane and coal or rock in Community mines and proposals for their improvement (rapporteur: M. Jean Belin).
- Improvement and Refresher Training in the French, German and UK coal mining industries (Mr RIDDELL - National Coal Board).

A complete list of the studies which have been undertaken under the auspices of the Safety and Health Commission during the past five years (1976-80) is annexed to this report.

9. Measurements of levels of radon and its daughters in non-uranium mines

The Public Health and Radiation Protection Division of the Directorate-General for Employment and Social Affairs, at the request of the Safety and Health Commission, had a series of measurements carried out by the French Commissariat à l'Energie Atomique.

These measurements were made in three coal mines, one iron ore mine, one potash mine, one pyrites mine and two blende and galena mines, and were concluded at the end of 1980. These mines are situated in Belgium, France and Italy.

- 1) Air samples were taken at different points by means of flasks, partly in the airflow in roadways and partly in vessels attached to the rock. The purpose of these measurements was to establish the concentration of the radon at specific points, and to determine the level of radon emission by the rock.
- 2) A single instrument (working-level meter) was used at the same point to measure the levels of energy originating in radon daughters.
- 3) Any effect on personnel was established by means of individual dosimeters worn by a number of miners for two periods of one month.

The final results of these measurements will not be available until some time in 1981 and they will subsequently be compared with those already obtained in the mines of other Member States.

10. Council Directives.

Further to § 1.4.5.4 of the 17th Report, there follows a progress report on the preparation of directives concerning the Community action programme on health and safety.

These directives are issued by the Council pursuant to Article 100 of the EEC Treaty. On 27 November 1980 the Council adopted the Directive on protection of workers from the risks related to exposure to chemical, physical and biological agents at work (OJ L 327 of 3 December 1980). This Directive (which is a framework directive) covers all industrial activities apart from sea and air transport, and provides for:

- medical surveillance of workers exposed to lead and asbestos, arsenic and its compounds, cadmium, mercury and nickel;
- informing workers of the dangerous nature of certain agents;
- technical, preventive, health and medical measures (including the establishment of limit values) to be considered by Member States when they come to introduce laws on certain agents;
- consultation of both sides of industry;
- drawing up of specific directives on certain agents.

Pursuant to this Directive, the Commission has submitted to the Council:

- a proposal for a Council Directive on the protection of workers from harmful exposure to metallic lead and its ionic compounds at work (OJ C 324 of 28 December 1979).
- Proposal for a second Council Directive on the protection of workers

from the risks related to exposure to agents at work: asbestos (OJ C 262 of 9 October 1980).

These two proposals spell out the measures which Member States should take to protect workers exposed, in particular by establishing:

- exposure conditions for the purposes of these Directives;
- the ambient limit values and, in the case of lead, also the biological values;
- the sampling and analysis methods and sampling strategy;
- the frequency of health monitoring.

As regards sampling methods, account is taken in the proposal relating to lead of the special conditions which may exist in mines (see Annex 2 of the Directive: "In certain circumstances, such as mines, special sampling equipment may be required").

The position as at 31 December 1980 was that both Directives were being examined by the European Parliament and the Economic and Social Committee.

At its meetings of 25 March and 7 May 1980, the Safety and Health Commission discussed at length the legal implications of, on the one hand, Council Directives and, on the other, any proposals to governments that the Safety and Health Commission might draw up on the same or similar subjects. Examples of this were the directives on asbestos and lead.

The conclusion reached can be summarized as follows:

" There is no reason why the criteria specified for all industries should not also be applied in mines, but the

implementation of the monitoring arrangements should take account of the specific nature of underground work in mines".

The "Proposal for a Council Directive on the approximation of the laws of the Member States concerning electrical equipment for use in potentially explosive atmospheres in mines susceptible to firedamp" was submitted to the Council on 1 February 1980 (see chapter on 'Electricity').

11. Examination of the 17th Report of the Safety and Health Commission.

The 17th Report (1979) was approved by the Safety and Health Commission at its meeting of 7 May 1980.

12. Secretariat.

Mr Jules LECLERCQ, mining engineer, who had taken over as Secretary to the Safety and Health Commission in 1970, reached retiring age on 6 June 1980. The Commission asked Mr Pierre LEMOINE, mining engineer, head of the Industrial Safety Division, to take over the Secretariat of the Safety and Health Commission as from 1 July 1980.

SECTION II

ACTIVITIES OF THE WORKING PARTIES

S E C T I O N I I

ACTIVITIES OF THE WORKING PARTIES

CHAPTER A

RESCUE ARRANGEMENTS, MINE FIRES AND UNDERGROUND COMBUSTION

Two meetings of the full Working Party were held on 4 March 1980 and 25 - 26 September 1980.

In addition, the Committee of Experts on Fire-resistant Fluids met on 31 January, 23 May and 19 September 1980.

An ad hoc expert committee completed a comparative report on the accidents at Merlebach (30 September 1976) and Schlägel und Eisen (27 October 1976) and attempted to identify aspects common to the two accidents and to draw conclusions from them. Three ad hoc expert committee meetings continued the work on belt conveyors.

An ad hoc expert committee drew up a document on the design and testing of oxygen self-rescuers.

The Safety and Health Commission subsequently approved the report on the Merlebach and Schlägel und Eisen accidents at its meeting on 7 May 1980 and asked for the inclusion of this document in its 17th Report.

On the same date, it approved the report on the design and testing of oxygen self-rescuers.

The Working Party concerned itself with methods of early detection fires, especially those involving conveyors.

For some time there has been an awareness among mining engineers, especially as a result of the Schlägel und Eisen accident, of the fact that fires which may start in the form of smouldering near conveyor installations

may give rise to serious and destructive accidents.

Early detection of such fires obviously makes an essential contribution to safety, and enables rapid counter-measures to be taken.

A symposium on this topic was organized on 26 September 1980 and attended by 43 experts in this field. The meeting reviewed the various types of sensor and means of signal transmission.

There is a need for highly sensitive systems with a more specific response than sensors based on infrared CO analysis. New systems such as semi-conductor sensors or the thermal noise detector or radioactive sources may open up promising avenues of approach.

The Working Party will pursue its activities in this field by a study trip to experimental mine facilities in the Federal Republic of Germany early in 1981.

The proceedings of the symposium are now available.

The Committee of Experts on Fire-resistant Fluids completed Part IV of the Sixth Report on Fire-resistant Fluids. This section deals with health criteria for hydraulic power transmission systems in mines.

At the three meetings held in 1980, the Committee of Experts considered and compared the tests described in the Fifth Report and those proposed for the Sixth Report.

A provisional Report already exists and is currently being edited. The revised text will be resubmitted to the Committee of Experts and the Working Party before publication.

The function of the ad hoc expert committee set up to deal with conveyor belts was to compile and scrutinize information on quality control tests for belts with textile carcass. The aim is to develop small-scale tests confirming that the fire-resistance of the belts delivered to mines is the same as that determined by the type approval tests (i.e. the drum friction and propane burner tests).

In 1978, the Safety and Health Commission had laid down a period of three years for experimental use of the Barthel burner and Critical Oxygen Index tests. Following this decision, intensive cooperation developed between the testing stations and the manufacturers at both national and international level.

The Barthel burner test has been employed in the United Kingdom (National Coal Board) for over 20 years. Experience of its use, however, is limited to belts with textile carcass and PVC covers. In view of the length of belt installed in Britain and the rareness of fire propagation by belts, it would appear that the testing carried out there justifies the conclusion that this type of test is in practice adequate for quality control of the type of belt used.

Use of the critical oxygen index test gives rise to problems. In order to solve them, various laboratories in a number of countries have conducted tests on standard, homogeneous sheets of PVC.

It was established that the tests are reproducible when a homogeneous material is used but not when the material is non-homogeneous, in which case the test results cannot be reliably interpreted. Further work is in hand and a statistical analysis of the test results obtained will be carried out by an expert in the field.

Work was continued on drafting of the report on requirements to be satisfied by oxygen self-rescuers.

The initial, basic specification for such apparatus producing oxygen by chemical reaction was a life of 90 minutes under severe service conditions of use. Chemical oxygen self-rescuers satisfy most of these requirements without being too heavy or bulky and require less maintenance than compressed-oxygen apparatus.

This year the Safety and Health Commission approved as a proposal to Governments the document 'Guidelines for the Construction and Testing of Chemical Oxygen Self-Rescuers' (for use in Coal Mines) Doc. No 4936/8/78.

The next year's work will be concerned with the problem of adapting the testing procedures to more accurately represent the true protection given to a miner by an oxygen self-rescuer, and with the drafting of documents on the maintenance of self-rescuers and training of potential users.

There is world-wide interest in research into chemical oxygen self-rescuers. This was confirmed by the visit of a delegation from the American mining industry, which had come to enquire into the use and testing of such apparatus in Europe.

CHAPTER B

WINDING ROPES AND SHAFT GUIDES, WINDING ENGINES AND WINCHES

The Working Party held two plenary meetings, one in Luxembourg on 14 March 1980 and the other in Bourg-en-Bresse on 9 and 10 October 1980.

In addition, a restricted meeting was called with a view to drawing up a medium-term work programme. This programme will be submitted first to the Working Party and following agreement to the Safety and Health Commission in 1981.

The first meeting was devoted to examining the report on 'Safety considerations in transport and man-riding in coal mines using rope-hauled monorail systems' (rapporteur: Mr HOISCHEN). This report is available as Doc. No 2778/80.

It covers the following aspects:

- the limits of use, defined by the tractive force of the winch (maximum 30 kN), the speed of travel (2m/sec.) and the gradient (20°);
- the measures necessary to prolong the life of the haulage rope;
- the requirements to be met by the emergency stop device (type of construction, careful supervision).

Attention is also drawn to inspection of these installations and the training of personnel concerned.

A second report was also received, completing the study of safety problems in the use of rope guides (Doc. 5720/1/79) (Authors Mr SŁONINA and Prof. STUEHLER).

The detailed examination of these two reports will be continued in 1981.

The meeting held in Bourg-en-Bresse made it possible to observe the manufacture of winding ropes at first hand in a large specialized factory. The Working Party looked at the manufacture of steel wire, the surface treatment of the wire, and the ways in which it was made up into ropes for shaft winding and for transport in roadways.

Special attention was devoted to the surface protection of steel wire during the manufacturing process. This is particularly important in order to avoid external and internal corrosion of the ropes.

The Working Party's report on 'Uniform safety regulations for winding ropes and cappings' (Doc. No 5379/4/78) will be submitted to the Safety and Health Commission at the beginning of 1981.

At its meeting on 7 May 1980, the Safety and Health Commission examined the Working Party's report on a survey relating to cage-arresting devices (Doc. No 2663/1/78).

The Safety and Health Commission found this document interesting, although there is still some doubt as to the limits of use of these devices. However, it adopted this report as an information document in accordance with Articles 3 and 6 of its terms of reference. It is annexed to the 17th Report.

In 1979 the Working Party recommended that the Commission of the European Communities consider the following three research projects for inclusion in the mining safety programme:

- Study of the influence of intermittent loads on the life-span of components used in winding and lifting techniques in mining (Westfälische Berggewerkschaftskasse-Bochum);
- Improvement of testing of winding and suspension gear used in shafts (M.R.D.E.-Bretby);

- Development of procedures to increase the efficiency of braking systems on winding engines (Cerchar-Paris).

The Commission of the EC followed the advice of the Working Party in granting financial aid to these three projects.

CHAPTER C

E L E C T R I C I T Y

1. Two meetings of the full Working Party and two preparatory meetings were held in the course of the year.
2. On 1 February 1980, the Commission of the European Communities submitted its 'Proposal for a Council Directive on the approximation of the laws of the Member States concerning electrical equipment for use in potentially explosive atmospheres in mines susceptible to firedamp'. This text had been drawn up by the Working Party on Electricity and approved on 1 December 1978 by the Safety and Health Commission (see 17th Report of the Safety and Health Commission, § 2.3.2). ¹⁾

The opinion of the Economic and Social Committee was delivered on 29 May 1980 and published in the Official Journal of the European Communities N° C 205.

This opinion was generally favourable to the Directive but contained two important proposals:

- that the European Standards of the European Committee for Electro-technical Standardization (CENELEC) should correspond to the standards introduced by the Directive (Harmonized Standards) and that a procedure for consultation between CENELEC and the Safety and Health Commission should be established to this end;
- that the procedures laid down by the two 'surface' directives ²⁾ and the Directive on mines susceptible to firedamp should be identical.

¹⁾ Published in the Official Journal of the European Communities N° C 104 of 28 April 1980, p.p. 92 - 111.

²⁾ These Council Directives (N° 76/117/EEC of 18.12.1975 - framework directive; N° 79/196/EEC of 6.2.1979 - implementing directive) relate to the approximation of the laws of the Member States concerning electrical equipment for use in potentially explosive atmospheres. They were published in the Official Journal of the European Communities N° L 24 of 30 January 1976, p.p. 45 - 48, and No L 43 of 20 February 1979, p.p. 20 - 22.

The second point will have to be discussed by the Council, although it has not yet started to examine the Directive.

The European Parliament delivered its opinion on 11 July 1980. It approved the draft Directive without amendment.

3. As mentioned in § 2.3.2 of the 17th Report of the Safety and Health Commission, the German representatives on the Safety and Health Commission opposed the draft Directive because paragraph 14.2.1 of European Standard EN 50 018 as included in this draft made no provision for the particle emission test of flameproof enclosures which is prescribed in Germany.

On 18 April 1980, the Bundesrat of the F.R. of Germany adopted a resolution on this draft Directive. It asks the Federal Government to endeavour, in the course of negotiations in the Council, to ensure that the Directive will apply to mines susceptible to firedamp in the Federal Republic of Germany only after a transitional period of three years from the date on which it enters into force.

The explanatory memorandum states that in view of the need to maintain the safety standards hitherto obtaining in the German coal mining industry, omission of the proposed special provision would be acceptable only if the regulations on particle-proof testing continued to apply in the Federal Republic of Germany for a transitional period of three years from the date on which the Directive enters into force. It may be assumed that by the end of this transition period protective devices (e.g. high-speed short-circuit shutdown devices) now in course of development will be available in the Federal Republic of Germany and will make it possible to dispense with the provisions hitherto applying.

This resolution ought to facilitate the Council's negotiations.

4. In pursuance of remit 9.3 of the Working Party, began work on drawing up the certificate of conformity required for implementation of the Directive ¹⁾.

1) This certificate of conformity attest that the type of electrical equipment complies with the Harmonized Standards. It is issued following examination and if necessary of the equipment by an approved body.

5. The Working Party was instructed by the Safety and Health Commission to study the group accident at Golborne Colliery with regard drawing up proposals concerning the use of electricity underground. The Working Party will submit its conclusions in the course of 1981.
6. The Working Party advised the Commission on a proposal for a research project submitted by the Westfälische Berggewerkschaftskasse on the safety of enclosures for electrical apparatus with flame traps allowing pressure relief. In the light of this opinion, the proposal will be revised to take account of the relevant developments in other countries.

CHAPTER D

FLAMMABLE DUSTS

One meeting of the full Working Party was held on 25 November 1980; a select meeting was held on 11 January 1980.

The latter meeting finalized document 3419/9/77, which is summarized in § 2.4.2 of the 17th Report: a proposal to the Governments with regard to dust neutralization by means of calcareous dusts in underground mine workings. This report was approved by the Safety and Health Commission at its meeting on 25 March 1980 and is attached as Annex VII to the 17th Report.

This document completes the Working Party's remit for the time being. However on reviewing the activities of the various Working Parties in October 1980, the Safety and Health Commission decided to keep this Working Party in being and to reactivate it as soon as the research findings on triggered barriers had provided sufficient material to form a basis for work by the Safety and Health Commission.

An information day on the research will be arranged at the end of 1981 to ensure good liaison between research work being undertaken and the Working Party's activities, which may in due course be defined by a new remit particularly concerned with precautions against explosions.

CHAPTER E

COMMON ACCIDENT STATISTICS

The Working Party did not meet in 1980.

The compilation of common statistics in the oil and gas sector was begun by the Working Party on Oil and Gas and Other Materials extracted by boreholes.

CHAPTER F

HEALTH IN MINES

The Safety and Health Commission and its Restricted Committee considered the activities of Working Party on Health in Mines on 3rd. and 22/23rd. October 1980 and it was agreed to concentrate initially on two main problems:

- control of respirable dust;
- reducing noise and vibration.

Two committees of experts were set up to this end. The preparatory work for these decisions had been done by a special group on 27 August 1980.

The work on dust control, will relate essentially to measurement of dust concentrations in underground workings, and will be based on a large-scale joint research project, carried out in all the coalfields of the Community with ECSC aid, which was completed at the end of 1980.

This research project required five years of careful work. Its aim was to compare measurements of dust concentrations carried out simultaneously according to the gravimetric methods adopted in the Member States of the Community.

It is divided into two parts:

- a) comparison of dust concentrations measured using different instruments;
- b) comparison of the classifications of workings, in terms of danger to health, derived from the above measurements according to the assessment criteria followed in each country.

It can be seen that this research is the foundation for the deliberations of the Working Party on Health in Mines, in accordance with the terms of reference which it was given by the Safety and Health Commission.

The Committee of experts set up to study noise and vibration will take as its starting point the study 'Noise in underground workings - collation of available information on the distribution of noise in mines and of existing regulations' carried out by Mr Gérard DEGUELDRE. At the end of 1980, this study was nearly complete.

CHAPTER G

HUMAN FACTORS AFFECTING SAFETY

1. Two meetings of the full Working Party took place in 1980 and four preparatory meetings were held.
2. In accordance with the instructions of the Safety and Health Commission, an editorial committee drew up a report on workers' participation in the inspection of underground mines for safety and health purposes. The draft report will be submitted to the Safety and Health Commission in 1981.
3. Work was completed on the study mentioned in § 2.7.2 of the 17th Report on 'Refresher training in the French, German and UK mining industries - A review of current activities for a collaborative training programme'. This study was jointly conducted by the National Coal Board, the Charbonnages de France and the Ruhrkohle AG, the National Coal Board being responsible for coordination.
4. The new terms of reference of the Working Party were adopted by the Safety and Health Commission at its meeting on 7 May 1980. A work programme has been drawn up on the basis of these terms of reference which will be submitted to the Safety and Health Commission at the beginning of 1981.
5. In pursuance of its terms of reference, the Working Party undertook the following activities.
 - Preparation of a report on the safety campaigns conducted in recent years in the Member States, the purpose of which is to summarize the observed results of campaigns in order to produce suggestions for improvements in their organisation.
 - Preparation of a report on the manner in which regulations and managers' rules on safety and health are drawn up and implemented. In this consideration will be given to established practice in the various Member States.

The purpose of this work is to establish

- on what basis and by what procedure such regulations and rules are drawn up for mines;
- how these regulations and rules are brought to the notice of the workforce (including managerial staff and supervisors);
- how these regulations and rules are applied.

6. Safety campaigns

- 6.1. The Working Party took note of the final report on the safety campaign in quarries organized in the United Kingdom in 1978 and 1979. The safety campaign in opencast mines and quarries conducted in Italy proceeded in 1980.
- 6.2. The Safety and Health Commission assented to a proposal by the Working Party for the preparation, with financial assistance from the EC-Commission, of two safety campaigns in 1981. The first, to be conducted in the Federal Republic of Germany, will deal with the handling of heavy loads at face ends, while the second, in Belgium, will be concerned with the handling of support units at the main gate end of the face.

CHAPTER H

VENTILATION, FIREDAMP AND OTHER MINE GASES

1. Two meetings of the full Working Party were held on 5 June and 18 December 1980.

In addition, two preparatory meetings were arranged and a meeting of experts responsible for drawing up minimum design and testing requirements for hand-held methanometers.

2. The Working Party drew up a 'Second report on ignitions of firedamp by power loaders and heading machines' ¹⁾. This report contains proposals to the Governments with regard to automatic methane monitoring, the location of detectors, ventilation of the space between the coal face and the body of the machine, horizon control and automatic extinguishing of ignitions. The draft was approved by the Working Party at the end of the year and will be submitted to the Safety and Health Commission in 1981.

3. The Working Party was able, on the basis of a substantial body of documentation, to undertake a study of the materials or combinations of materials used for the impellers and housings of auxiliary fans in accordance with the instructions of the Safety and Health Commission.

On 18 December 1980, the Working Party acquainted itself with the work carried out in this field by the Health and Safety Executive Explosion and Flame Laboratory (SMRE) in Buxton (UK). It decided to propose to the Safety and Health Commission that the scope of this research be extended to include materials or designs not yet investigated by the SMRE with a view to formulating conclusions which would be generally applicable to gassy mines of the Community.

Given the support of the Safety and Health Commission, the Commission of the European Communities might agree to promote this research as part of its 'Safety in Mines' programme.

¹⁾ The first report approved in 1977 was published as Annex X to the 14th Report of the Mines Safety and Health Commission.

4. The Working Party was also instructed to undertake an 'Examination of the special requirements for workings with auxiliary ventilation in which dust control and air conditioning equipment is used' and an 'Examination of controlled partial recirculation of air in drivages'.
5. The Working Party carried out an initial study, on the basis of the relevant reports, of the circumstances attending the group accidents at the Golborne and Hansa collieries (in the U.K. and F.R. of Germany respectively). Conclusions with regard to the ventilation aspects will be submitted to the Safety and Health Commission.
6. The Committee of Experts on Firedamp Monitoring Instruments drew up a document setting out minimum design and testing requirements for hand-held methanometers, which could provide a basis for proposals to the Governments pursuant to Article 1 of the terms of reference of the Safety and Health Commission.
7. A study was commissioned from an expert in the field of outbursts with a view to determining the preventative measures to be taken against instantaneous outbursts of methane which may be accompanied by projected coal or rock.

CHAPTER I

MECHANIZATION

The Working Party on Mechanization held a plenary meeting on 10 January 1980.

Two restricted meetings were held, on 24 July 1980 and 26 November 1980.

As stated in the 17th report, the Working Party has completed its report on "Safety Techniques in the Operation of Belt Conveyors" (Doc. No 2193/8/77). This report will be submitted to the Safety and Health Commission in 1981.

It deals with the safe use of belt conveyors, excluding those which form an integral part of mobile winning or loading equipment.

In its present form, it meets the requirements laid down by the Safety and Health Commission in accordance with its terms of reference:

- to compile, for use by the mining companies, a schedule of the minimum work safety requirements for mechanical protection of machines and equipment, to be respected by machinery manufacturers;
- to study safety provisions such as: visual and acoustic signalling, operating controls and in particular the ability to stop machines from any point on the roadway, taking account of modern means of telecommunication and remote control, electrical protection of motors in the event of overloading or jamming of equipment, lighting, etc.

An Ad hoc Committee drew up a work programme for the next four years, covering locomotive traction, transport of loads, including

trackless transport, monorails and roadway drive machines for rock and coal, which will be submitted to the Working Party in due course. This will not include rope haulage applications which will be dealt with by the Winding ropes and shaft guides, winding engines and winches Working Party.

CHAPTER J

STRATA CONTROL AND STABILITY OF GROUND

A single meeting of the full Working Party was held on 30 April 1980.

There were also, however, four meetings of ad hoc expert committees at which a document on tip stability was drafted and a fifth such meeting was devoted to the reduction of the risk of accidents resulting from falls of ground in headings, in gateroads of longwall districts and in development drivages.

In the course of the year, the Working Party drew up a report analysing the rockburst hazard and setting out the methods used in the various countries for the reduction of this risk.

This report was approved by the Working Party on 30 April 1980 and by the Safety and Health Commission on 23 October 1980. It will be distributed as an information report.

This document (3888/9/77) reviews the main factors which may lead to an increased risk of rockbursts. A rockburst is defined as a release of strain energy causing accidents and damage.

Such incidents have occurred in several coalfields. The criteria for rockburst hazards are generally thought to be geological and geometrical in nature, acting separately or together.

Among the geological factors are depth, presence of a thick strong stratum in the immediate vicinity of the seam, faults or irregularities in the strata.

The geometrical factors include working boundaries or rib edges in the same or neighbouring seams, and remnant pillars left in overlying or underlying seams or rib edges thereof.

The development and start-up phases of certain faces also give rise to danger.

All of these factors should be taken into consideration at the planning stage in order to minimize the risks.

The main precaution to be taken during the mining operations is to drill stress detection and relief holes. This operation involves a certain risk for the men involved. A range of measures were proposed for , improvement of methods of identifying danger zones, use of remote-controlled drilling machines, development of methods of stress relief and investigation of the relationship between the properties of the adjacent strata, faulting and rockbursts. It is also desirable that arrangements should be made for the regular collection and exchange of information on rockbursts, not only in coal mines but also in other mines.

The Ad hoc Committee on the Stability of Tips examined the various factors to be taken into account when constructing, maintaining or removing tips. The main conclusions are as follows. First of all, the site chosen must be well prepared and drained. A plan must be drawn up for the construction of the tip in accordance with technical rules and good working practice. Care must subsequently be taken to ensure that the operations are carried out in conformity with this plan. Even when a tip is no longer in use it must be kept under observation as accumulations of water or slumping may become apparent in the long term.

Removal of material from tips has sometimes given rise to accidents; here too, the operation must be planned in advance and conducted with care.

The Working Party began to compile data with a view to studying work at heading faces, whether in drivages in the solid or in the gate-roads serving longwall faces. These are locations where there is a high

concentration of manpower despite increasing mechanization and an appreciable risk of falls of ground.

The Working Party has already made proposals with regard to strata reinforcement by bolting, dowelling and injection techniques and to the construction of gateside packs.

The choice of working methods may, however, also have an effect on the risk of falls of ground or strata movement. Work on this subject is currently in hand.

CHAPTER K

OIL, GAS AND OTHER MATERIALS EXTRACTED BY BOREHOLE

Two meetings of committees of experts were held in 1980:

8 January 1980: evacuation of installations and rescue of men overboard;

17 April 1980: joint meeting of the Committee of Experts on Well Control and Installation Evacuation.

The first meeting examined the document dealing with the evacuation procedure for offshore installations and the rescue of men who have fallen overboard (Doc. No 2523/2/79). This document will be submitted to the Safety and Health Commission in 1981.

The second meeting was devoted to an oral report by a Norwegian representative on the group accident which occurred on the Alexander Kielland installation on 27 March 1980.

It should be noted that other international bodies also have the task of dealing with problems linked with offshore drilling. Problems related to buoyancy of structures, certification and checking of installations come under IMCO (Intergovernmental Maritime Consultative Organization) and the Conference on Safety and Pollution Safeguards in the Development of North-West European Offshore Mineral Resources.

The document mentioned above (Doc. No 2523/2/79) covers the evacuation aspect of the accident.

With regard to well control, it was decided to prepare opinions on land boreholes similar to those already adopted for offshore boreholes.

Guidelines will also be established for the 'emergency plans', which need to be adapted to the particular circumstances of each installation.

A statistical table on the oil and gas drilling industries has been prepared with a view to the compilation of separate common statistics for these industries. It will be submitted to the Safety and Health Commission during the coming year.

The proposal to governments on well control exercises and training of the responsible personnel was adopted by the Safety and Health Commission at its meeting on 7 May 1980, in accordance with Articles 1 and 4 of its terms of reference.

SECTION III

COMMON ACCIDENT STATISTICS

4.1.1 At the end of this chapter will be found the following tables:

- Ia and Ib

Victims by cause and place of accident, and period of incapacity in absolute figures (a) and frequency rates (b).

These tables are given by country and for the Community as a whole and refer to 1980.

They are available from the Secretariat by coalfield.

- 2a

These tables are available by country, but as the basis for estimating periods of incapacity was not uniform, they do not permit data to be provided for the Community of Nine. The breakdown of accidents by duration of incapacity will need to be revised at a future date.

- A and B

Frequency rates for serious injuries (A) and fatalities (B) for each of the countries of the Community of Six since 1958 and frequency rates for fatalities (B) since 1973 and serious injuries (A) since 1977 for the United Kingdom.

- C

Group accidents by cause for the Community as a whole.

- D

Summary tables for the Community of Six since 1958 and the United Kingdom since 1973.

4.1.2 It is now possible to analyse all categories of accidents for the Community of Nine for the last five years.

Nevertheless, in order to trace the long-term trend since 1958 or 1971, certain tables still relate to the Community of Six.

4.2. Examination of statistics from 1976 to 1980 (Community of Nine).

4.2.1. Trend of frequency rates.

Year	Period of incapacity			fatalities	total
	4 to 20 days	21 to 51 days	56 days		
1976	100.94	42.10	11.74	0.300	155.07
1977	99.60	41.17	11.49	0.201	152.46
1978	98.97	39.99	11.62	0.248	150.82
1979	91.62	36.65	10.76	0.235	139.26
1980	87.02	34.07	9.89	0.250	131.22

As has already been pointed out in 1.1.2., the development between 1979 and 1980 was favourable and statistically significant for all categories of injuries. The increase in fatalities is not significant in the mathematical sense of the term.

Over the five years, the trend has been favourable despite a slight and non-significant increase in serious injuries and mortalities in 1978 as well as a non-significant trend in the frequency rate for fatalities between 0.200 and 0.300.

4.2.2. Trend in the absolute figures.

The total number of accidents resulting in more than 3 days' absence from work fell from 77 856 in 1979 to 74 102 in 1980, the number of hours worked being slightly higher.

Between 1976 and 1980 the number of accidents fell by 17 016 (91 108 in 1976 compared with 74 102 in 1980) or 18.67%, whereas the number of hours worked fell by only 3.9% (587 597 666 in 1976 compared with 564 709 983 in 1980).

4.3.3. Breakdown of accidents in 1980 by period of absence from work

	absolute figures	share of the total
- absence from work of between 4 to 20 days	49 139	66.31%
- " " " " " 21 and 56 days	19 239	25.96%
- " " " " " more than 56 days	5 583	7.53%
- fatalities	141	0.10%
Total	74 102	100.00%

This breakdown shows a small increase in slight injuries but is practically identical to that for the four previous years.

4.4. BREADKOWN OF ACCIDENTS BY MAIN CAUSES AND BY SERIOUSNESS
(Headings I to V of tables 1)

4.4.1. Table with figures given as a percentage of the total of Headings I to XII

Causes	Incapacity	4 to 20 days	21 to 56 days	> 56 days	fatalities	Total
		%	%	%	%	%
I. Falls of ground		20,3 ↓	18,8 ↑	19,0 ↓	(27,0) ↑	19,8 ↓
II. Transport		9,3 ↓	10,1 ↓	15,8 ↑	(40,4) ↑	10,0 ↓
III. Slipping, falling & stumbling		27,1 ↑	32,1 ↑	28,6 ↑	(11,3) ↓	28,5 ↑
IV. Machinery, tools etc		16,7 ↑	15,0 ↑	13,1 ↑	(7,8) ↑	16,0 ↑
V. Falling objects ...		16,9 ↑	17,3 ↓	18,0 ↓	(7,1) ↓	17,1 ↑
Total.....		90,3 =	93,3 ↑	94,5 ↓	(93,6) ↑	91,4 ↑

Changes compared with 1979:

Key: No change =
Increase: : ↑
Decrease: : ↓

Note: () means not statistically significant or random variation in the mathematical sense of the term.

4.4.2. Conclusions to be drawn from this table

All the causes of accidents shown here taken together represent approximately 90% of total causes - a very slight increase over the previous year.

The proportion accounted for by each of the five headings increases with the seriousness of the accident (from 90.3% for 4-20 days to 94.5% for more than 56 days). The figures for fatalities are too random from the mathematical viewpoint to lend themselves to comparisons.

A comparison of the injury figures with those for 1978 and 1979 shows a decrease under the headings of falls of ground and transport. On the other hand, there was an increase under slipping, falling and stumbling, under falling objects and under machinery, handling of tools and supports.

These comments are very similar to those made in the previous three reports in which this kind of table was given; the most salient feature is the constant decrease in accidents caused by falls of ground.

4.5. Conclusions

These figures show that the general trend in safety in the coalmines of the Community of Nine has improved from one year to the next.

Increasing mechanization, particularly of support systems, has brought with it a decrease in accidents from falls of ground. It is encouraging to note that accidents due to machinery, tool handling and supports have declined at the same time; this is the result of the efforts made to make equipment safer.

4.6. Chronological trend over several years in the Community of Six

As was said earlier on, some statistics serve to illustrate the long-term trend for the former Community of Six.

4.6.1. This trend has been determined for all categories of accidents since 1971 and is shown in Table E below.

The figures for severe injuries in 1980 show little change over those for 1979. For the category 4-56 days' absence from work, they are generally more favourable than those of earlier years but the trends of some years are negative.

- 4.6.2. In the case of injuries resulting in more than 56 days' absence from work, the comparison can be taken back to 1958 and this is shown in the last column of Table D. The frequency rate, which remained stationary at around 13 from 1958 to 1967 started to climb thereafter to reach 15.52 for the current year.
- 4.6.3. The number of fatalities has genuinely declined, the frequency rate falling by about 40% since 1958; this, however, does not allow statistically valid conclusions to be drawn.

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Common Statistics on victims
of accidents underground in coal mines

(absolute figures)

YEAR 1980

MAN-HOURS WORKED (1) 564,709,983

COUNTRY COMMUNITY OF THE IX

SITE OF THE ACCIDENT	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6			
	Period of incapacity	4 to 20 days (1)	21 to 56 days (2)	> 56 days (3)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (2)	> 56 days (3)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (2)	> 56 days (3)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (2)	> 56 days (3)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (2)	> 56 days (3)	Fatal acci- dents	total	> 56 days (3)	Fatal acci- dents	total
I. FALLS OF GROUNDS AND ROCKS		5656	1988	573	21	8238	3101	1213	376	16	4706	55	20	11	0	86	1156	391	98	1	1646	9968	3612	1058	38	14676			
II. TRANSPORT, TOTAL		1018	499	200	14	1731	557	185	116	3	861	106	56	48	2	212	2884	1196	520	38	4638	4565	1936	884	57	7442			
a) Continuous Transport		191	128	71	4	394	116	39	28	0	183	3	3	1	0	7	228	96	47	4	375	538	266	147	8	959			
b) Discontinuous Transport		827	371	129	10	1337	441	146	88	3	678	103	53	47	2	205	2656	1100	473	34	4263	4027	1670	737	49	6483			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL		3343	1808	446	1	5598	2538	1281	308	1	4128	273	160	46	8	487	7161	2925	799	6	10891	13315	6174	1599	16	21104			
a) While moving about the mine		476	202	47	1	726	393	129	34	0	556	56	19	3	1	69	2901	990	249	0	4140	3816	1340	333	2	5491			
b) In the course of other activities		2867	1606	399	0	4872	2145	1252	274	1	2328	227	141	43	7	418	4260	1935	550	6	6751	9499	4834	1266	14	15613			
IV. MACHINES, TOOLS AND SUPPORTS TOTAL		3475	1269	356	6	5106	2088	709	195	5	2997	97	33	8	0	138	2568	870	171	0	3609	8228	2881	730	11	11850			
a) Machines		529	231	93	3	856	269	132	56	2	459	20	9	3	0	32	244	114	31	0	389	1062	486	183	5	1736			
b) Tools		902	310	71	0	1283	658	220	52	0	930	56	19	3	0	78	909	340	69	0	1318	2525	889	195	0	3609			
c) Supports		2044	728	192	3	2967	1161	357	87	3	1608	21	5	2	0	28	1415	416	71	0	1902	4641	1506	352	6	6505			
V. FALLS OF OBJECTS		3415	1491	461	2	5369	1972	683	220	4	2919	199	73	25	1	298	2717	1033	301	3	4054	8303	3320	1007	10	12640			
VI. EXPLOSIVES		23	3	1	0	27	4	2	0	0	6	0	0	0	0	0	21	7	1	0	29	48	12	2	0	62			
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST		4	2	16	2	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	2	16	2	24	16	2	24
VIII. OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO ₂ , CH ₄ , CO, H ₂ S), TOTAL		2	1	0	0	3	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3	2	0	0	5			
a) Outbursts of Gas		1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2			
b) De-oxygenation and Poisoning by natural Gases		1	1	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3			
IX. HEATINGS OR FIRES		1	0	0	0	1	2	1	0	0	3	0	0	0	0	0	7	0	0	0	7	10	1	0	0	11			
X. INRUSHES		11	0	1	0	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	12	0	1	0	13			
XI. ELECTRICITY		5	3	0	0	8	6	2	1	0	9	2	2	0	0	4	10	9	1	3	23	23	16	2	3	44			
XII. OTHER CAUSES		1025	294	76	2	1397	662	176	29	1	868	54	14	7	0	75	2919	799	172	1	3891	4660	1283	284	4	6231			
TOTAL		17978	7358	2130	48	27514	10931	4293	1245	30	16499	786	358	145	11	1300	19444	7230	2063	52	28789	49139	19239	5583	141	74102			

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme.

(2) Accidents involving more than five persons (i.e. who either died or were unable to resume work underground for at least eight weeks).

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Common Statistics on victims
of accidents underground in coal mines

(frequency rates)

YEAR 1980

COUNTRY COMMUNITY OF THE IX

MAN-HOURS WORKED (1) 564,709,983

SITE OF THE ACCIDENT	Production faces 1				Headings excluding shafts and staple-pits 2				Shafts and staple-pits 3				Other places 4				Total of accidents underground 5					Group accidents (2) 6							
	Period of incapacity	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	> 56 days (1)	Fatal acci- dents	total
I FALLS OF GROUNDS AND ROCKS		10,02	3,52	1,01	0,04	14,59	5,49	2,15	0,67	0,03	8,33	0,10	0,04	0,02	0	0,15	2,05	0,69	0,17	0,00	2,91	17,65	6,40	1,87	0,07	25,99			
II TRANSPORT, TOTAL		1,80	0,88	0,35	0,02	3,07	0,99	0,33	0,21	0,01	1,52	0,19	0,10	0,08	0,00	0,38	5,11	2,12	0,92	0,07	8,21	8,08	3,43	1,57	0,10	13,18			
a) Continuous Transport		0,34	0,23	0,13	0,01	0,70	0,21	0,07	0,05	0	0,32	0,01	0,01	0,00	0	0,01	0,40	0,17	0,08	0,01	0,66	0,95	0,47	0,26	0,01	1,70			
b) Discontinuous Transport		1,46	0,66	0,23	0,02	2,37	0,78	0,26	0,16	0,01	1,20	0,18	0,09	0,08	0,00	0,36	4,70	1,95	0,84	0,06	7,55	7,13	2,96	1,31	0,09	11,48			
III FALLS AND MOVEMENT OF THE VICTIM, TOTAL		5,92	3,20	0,79	0,00	9,91	4,49	2,27	0,55	0,00	7,31	0,48	0,28	0,08	0,01	0,86	12,68	5,18	1,41	0,01	19,29	23,58	10,93	2,83	0,03	37,37			
a) While moving about the mine		0,84	0,36	0,08	0,00	1,29	0,70	0,23	0,06	0	0,98	0,10	0,03	0,01	0,00	0,12	5,14	1,75	0,44	0,00	7,33	6,76	2,37	0,59	0,00	9,72			
b) In the course of other activities		5,08	2,84	0,71	0	8,63	3,80	2,22	0,49	0,00	4,12	0,40	0,25	0,08	0,01	0,74	7,54	3,43	0,97	0,01	11,95	16,82	8,56	2,24	0,02	27,65			
IV MACHINES, TOOLS AND SUPPORTS TOTAL		6,15	2,25	0,63	0,01	9,04	3,70	1,26	0,35	0,01	5,31	0,17	0,06	0,01	0	0,24	4,55	1,54	0,30	0	6,39	14,57	5,10	1,29	0,02	20,98			
a) Machines		0,94	0,41	0,16	0,01	1,52	0,48	0,23	0,10	0,00	0,81	0,04	0,02	0,01	0	0,06	0,43	0,20	0,05	0	0,69	1,88	0,86	0,32	0,01	3,07			
b) Tools		1,60	0,55	0,13	0	2,27	1,17	0,39	0,09	0	1,65	0,10	0,03	0,01	0	0,14	1,61	0,60	0,12	0	2,33	4,47	1,57	0,35	0	6,39			
c) Supports		3,62	1,29	0,34	0,01	5,25	2,06	0,63	0,15	0,01	2,85	0,04	0,01	0,00	0	0,05	2,51	0,74	0,13	0	3,37	8,22	2,67	0,62	0,01	11,52			
V FALLS OF OBJECTS		6,05	2,64	0,82	0,00	9,51	3,49	1,21	0,39	0,01	5,17	0,35	0,13	0,04	0,00	0,53	4,81	1,83	0,53	0,01	7,18	14,70	5,88	1,78	0,02	22,38			
VI EXPLOSIVES		0,04	0,01	0,00	0	0,05	0,01	0,00	0	0	0,01	0	0	0	0	0,04	0,01	0,00	0	0,05	0,08	0,02	0,00	0	0,11				
VII IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST		0,01	0,00	0,03	0,00	0,04	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0,01	0,00	0,03	0,00	0,04	0,03	0,00	0,04	
VIII OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO ₂ , CH ₄ , CO, H ₂ S), TOTAL		0,00	0,00	0	0	0,01	0,00	0,00	0	0	0,00	0	0	0	0	0	0	0	0	0	0,01	0,00	0	0	0,01				
a) Outbursts of Gas		0,00	0	0	0	0,00	0,00	0	0	0	0,00	0	0	0	0	0	0	0	0	0	0,00	0	0	0	0,00				
b) De-oxygenation and Poisoning by natural Gases		0,00	0,00	0	0	0,00	0	0,00	0	0	0,00	0	0	0	0	0	0	0	0	0	0,00	0,00	0	0	0,01				
IX HEATINGS OR FIRES		0,00	0	0	0	0,00	0,00	0,00	0	0	0,01	0	0	0	0	0,01	0	0	0	0	0,01	0,02	0,00	0	0	0,02			
X INRUSHES		0,02	0	0,00	0	0,02	0	0	0	0	0	0	0	0	0	0,00	0	0	0	0	0,00	0,02	0	0,00	0	0,02			
XI ELECTRICITY		0,01	0,01	0	0	0,01	0,01	0,00	0,00	0	0,02	0,00	0,00	0	0	0,01	0,02	0,02	0,00	0,01	0,04	0,04	0,03	0,00	0,01	0,08			
XII OTHER CAUSES		1,82	0,52	0,13	0,00	2,47	1,17	0,31	0,05	0,00	1,54	0,10	0,02	0,01	0	0,13	5,17	1,41	0,30	0,00	6,89	8,25	2,27	0,50	0,01	11,03			
TOTAL		31,84	13,03	3,77	0,08	48,72	19,36	7,60	2,20	0,05	29,22	1,39	0,63	0,26	0,02	2,30	34,43	12,80	3,65	0,09	50,98	87,02	34,07	9,89	0,25	131,22			

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme.
(2) Accidents involving more than five casualties (i.e. when either dead or were unable to resume work underground for at least eight weeks).

ANNEX

Explanatory notes - Tables 1

GENERAL DEFINITIONS

1. Accident

Bodily injury resulting from a sudden and abnormal external cause in the course of work.

The Mines Safety and Health Commission's statistics should only cover victims of accidents underground, including accidents which occur when men enter and leave the cages and while the cages are in motion.

2. Fatal accident

An accident causing the death of the victim within 56 days following the accident. Victims dying more than 56 after the day of the accident should not be included in the fatal accident category but in that of accidents resulting in incapacity involving an absence from work of more than 56 days.

3. Persons covered by the statistics

Pit staff and employees of contractor firms who belong to a miners' social security scheme.

The statistics count victims and not accidents, everyone who is the victim of an accident while actually underground as well as during descent and ascent should be included. Victims can therefore only be miners, supervisors, engineers or staff belonging to contractor firms.

4. Shifts and number of hours worked

Shifts and number of hours worked by the persons on the books of the mine and other staff belonging to a miners' social insurance scheme; account should be taken both of extra shifts and overtime.

The period of reference adopted is the period of actual exposure to risk; one therefore counts extra shifts and overtime in terms of time actually worked and not of number of hours paid.

5. Accidents rates

Number of accidents per million hours worked.

The frequency rates are arrived at by dividing the number of accidents of a given category by the total number of hours spent on all types of work underground.

CAUSES OF ACCIDENTS

I. Falls of Ground and Rocks

This category of accidents covers falls of stone or coal from its natural situation

It does not cover accidents caused by falls of ground resulting from one of the factors included under another category, for example the use of explosives, explosion of firedamp or dust, or an outburst. Accidents caused by falls of stone in a caved waste should be included in this category; on the other hand, accidents during the stowing of waste should be classed in category 5 "Falls of Objects". Accidents caused by materials continuing to move after falling from their natural position are included under category I "Falls of ground and rocks", except where it is a case of materials set in motion by some external cause after first coming to rest.

II. Transport

Accidents caused by any means of transport whether stationary or in motion, used to carry men or objects at the face, in other workings, in roadways, in shafts, staple pits, etc., including accidents caused by the engines providing motive power for transport. This category includes, for example, accidents caused by lumps of coal falling from a conveyor belt or blocks of wood from a tub loaded with timber, and even those caused when lumps of coal are projected during their descent down a fixed chute. An accident caused by the gear wheels or the driving mechanism of a transport system should also be included in category II "Transport".

Electrocution caused by a trolley wire should be included in category XI "Electricity".

a) Continuous Transport

Transport equipment which can receive products along the whole of its length and maintain a continuous flow.

b) Discontinuous transport

All other means of transport.

This category should include accidents caused particularly by skips, cages, kibbles, as well as accidents involving men or objects falling from these cages, skips or kibbles, rope haulages, locomotives, monorails, decking rams and other similar devices.

III. Falls and movement of the victim

a) While moving about the mine

Falls of men into a shaft or staple pit, falls in general, stumbles, slips, knocks and bumps, sprains of limbs, etc., whatever the cause, should be included, as long as the basic cause of the accident is the victim's movement through the mine in the course of or at the place of work and no means of transport is involved; the latter should be included in category II "Transport" or III b "Falls of victim during other activities" respectively.

b) In the course of other activities

Falls of men into a shaft or staple pit, falls in general, stumbles, slips, knocks and bumps, sprains of limbs, etc., as long as the fall was caused basically by some particular activity and not by the movement of the victim about the mine, which is covered in III a.

This category should only include accidents caused by the victim falling during his actual work and not during the course of moving about the mine as under category III a "Falls of victim while moving about the mine".

IV. Machines, tools and supports

a) Machines

Accidents caused by engines powering a means of transport should be included in category II "Transport". Category IV covers accidents occurring during the starting up and running of other machines.

Accidents caused by machines falling while being moved will be included in category V "Falls of objects".

b) Tools

Category IV covers accidents caused by the use of tools such as portable drills, drills on stands, hand saws, pneumatic picks, lifting gear, pushers, etc. Accidents caused by falling tools should be put into category V "Falls of objects".

c) Supports

With regard to accidents occurring during the handling of supports only those involving the setting up or removal of this equipment should be included in category IV. If a support or one of its components falls during transport, the accident should be included in category V "Falls of objects".

category IV only covers accidents arising from the use and movement of machines, tools and equipment; it is emphasized in the case of supports that only accidents occurring during the setting up and removal of this equipment should be included in this category.

V. Falls of objects

Accidents involving the falling or dislodging of excavated material, and of objects such as frames, timber, tools, props, pipes, materials, etc.

This category includes not only accidents caused directly by falls of excavating material or objects, but also those caused by objects falling while being handled.

VI. Explosives

Accidents occurring during the transport or handling of explosives, the charging of shot-holes, accidental or premature firing of shots, inadequate protection of personnel, unfired explosives being hit by picks or drills, mis-fires, long fires, residues and poisoning by fumes from explosives.

Where the use of explosives sets off an explosion of fire-damp or dust or even a heating or a fire, the accident should be included in category VII or IX respectively.

VII. Ignitions or explosions of firedamp and coal dust

This includes poisoning or suffocation by the gases so produced. An explosion of firedamp or coal dust brought about by the use of electricity should be classified under category VII. As a general rule, if the causes of an accident include the ignition or explosion of firedamp or dust, it should always be included in category VII.

VIII. Outbursts of gas - Deoxygenation, suffocation or poisoning by natural gases (CO₂, CH₄, CO, H₂S)

a) Outbursts of gas

Accidents caused by ejected materials of roof falls caused by sudden outbursts of gas. In accordance with the rule set out for category VII, if the outburst is followed by an explosion of firedamp, any accidents caused thereby should be included in category VII "Ignitions or explosions of firedamp or explosions of coal dust".

b) Deoxygenation and poisoning by natural gases (CO₂, CH₄, CO, H₂S)

This includes accidents caused by lack of oxygen, by suffocation (CH₄, CO₂) and by poisoning (CO, H₂S). If suffocation or poisoning is brought about by gas produced by explosives or by an explosion of firedamp or coal dust, or even by a heating or fire, the accident should be classified under those categories. If suffocation or poisoning is caused by exhaust fumes from diesel engines, the accidents should be included in category IV, "Explosives".

IX. Heatings or fires

This includes poisoning or suffocation by the gases produced, injuries from burns, roof falls, falls of objects, etc. following a heating or fire in the mine. A fire following an explosion of firedamp or coal dust should be in this category.

In general, if the accident is due to several combined causes including a heating or a fire, it should always be included in category IX "Heatings or fires" unless one of the causes is the ignition or explosion of firedamp or coal dust; in this last case the accident would be included in category VII.

X. Inrushes

Accidents occurring when old workings are broken into or when dead ground is encountered. Injuries from projected material, falls of objects, falls of ground drowning, etc.

XI. Electricity

Accidents caused by electricity - burns, shocks, electrocution. If electricity causes the accidental firing of explosives, an explosion of firedamp or coal dust or a heating or a fire, the resulting accident should be included in those categories in the following order of priority :

1. Explosion of firedamp or dust
2. A heating or fire
3. Explosives

XII. Other causes

This category covers accidents which cannot be classified under categories I to XI, that is to say, accidents of which it is not possible to establish the exact cause. This category may also be used to record accidents covered by compressed air.

SITE OF THE ACCIDENT

This means the place where the victim was at the time of the accident, which may be different from the victim's normal place of work.

1. Production faces

This comprises the working face including the part between the face or staple hole and the stowed or caved waste but does not include roads of any kind except dummy roads.

2. Headings excluding shafts and staple pits

This also covers the area where loading, timbering and steelwork are carried out immediately behind the face. In the case of slusher packing the curving area extends up to and including the line of props.

Development headings should be considered as drifts.

3. Shafts and staple pits

This also covers the immediate approach to insets especially where mine cars and stores are loaded and unloaded from the cages.

4. Other places

This heading covers all the victims of accidents not included under the three preceding headings.

PERIOD OF INCAPACITY

Accidents should be broken down as follows according to periods of incapacity :

- Accidents involving an absence of between 4 and 20 calendar days
- Accidents involving an absence of between 21 and 56 calendar days
- Accidents involving an absence of more than 56 calendar days
- Fatal accidents.

The day of the accident does not count. The number of days of incapacity to be taken into consideration is defined by the effective absence of the miner from work.

A. Comparative table of the number of persons incapacitated by accidents for longer than 56 days

Frequency rates

Years 1958 to 1976 : Community of the Six

Years 1977 to 1980 : Community of Nine

COMMUNITY (vi)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
1) Falls of ground	4,846	4,490	4,571	4,434	4,387	4,337	4,509	4,215	4,486	4,060	4,261	4,492	4,135	4,109	4,08	4,29	4,15	3,61	3,48
2) Transport	2,602	2,347	2,310	2,371	2,521	2,520	2,346	2,416	2,173	2,037	2,139	2,118	2,016	1,953	1,93	2,11	1,91	2,28	2,14
3) Movement of personnel	2,003	1,823	2,185	2,185	2,282	2,261	2,326	2,354	2,320	2,354	2,795	3,023	3,084	3,117	3,47	3,88	3,89	3,38	3,82
4) Machinery, handling of tools and supports	1,098	1,064	1,264	1,423	1,712	1,818	1,848	1,773	1,815	1,790	1,945	1,865	2,011	1,876	1,75	2,01	1,98	2,29	2,15
5) Falling objects	1,962	2,161	2,105	2,353	2,375	2,406	2,442	2,415	2,362	2,638	2,858	3,185	3,308	3,506	3,62	3,63	3,62	3,08	3,08
6) Explosives	0,023	0,020	0,017	0,012	0,018	0,010	0,011	0,013	0,007	0,019	0,015	0,019	0,011	0,002	0,008	-	0,01	0,006	0,01
7) Explosions of firedamp and dust	0,017	0,030	0,010	0,001	0,071	0,006	0,001	0,011	0,016	-	0,002	0,004	0,025	0,007	-	-	0,02	-	-
8) Gas outbursts, suffocation by natural gases	0,002	-	-	-	-	-	-	0,002	0,001	0,003	-	-	-	-	-	-	-	0,003	0,003
9) Fires & spontaneous combustion	-	-	0,002	0,001	-	-	-	0,002	-	-	0,002	-	-	-	-	0,003	0,01	0,003	-
10) Inrushes	0,002	-	-	-	0,001	0,002	0,003	-	0,001	-	0,002	-	0,009	0,002	0,003	0,009	-	-	0,01
11) Electricity	0,010	0,008	0,010	0,018	0,007	0,012	0,008	0,006	0,007	0,005	0,010	0,021	0,014	0,007	0,008	0,006	0,01	0,16	-
12) Other causes	0,985	1,012	0,513	0,428	0,404	0,390	0,364	0,289	0,354	0,337	0,341	0,333	0,434	0,509	0,73	0,84	0,53	0,37	0,40
TOTAL	13,551	12,954	12,986	13,227	13,781	13,781	13,861	13,506	13,242	13,246	14,370	15,160	15,047	15,088	15,60	16,77	16,12	15,05	14,92

COMMUNITY	1977	1978	1979	1980
1) Falls of ground	2,31	2,36	2,23	1,87
2) Transport	1,82	1,83	1,65	1,57
3) Movement of personnel	3,05	3,12	2,96	2,83
4) Machinery, handling of tools & supports	1,67	1,62	1,40	1,29
5) Falling objects	1,93	2,04	1,98	1,78
6) Explosives	0,01	0,01	0,01	0,00
7) Explosions of firedamp and dust	-	0,01	0,00	0,03
8) Gas outbursts, suffocation by natural gases	-	0,01	-	-
9) Fires & spontaneous combustion	-	-	-	-
10) Inrushes	-	-	-	0,00
11) Electricity	-	0,01	0,01	0,00
12) Other cause	0,70	0,62	0,51	0,50
TOTAL	11,49	11,62	10,76	9,89

B. Comparative table of underground fatalities

Frequency rates

Years 1958 to 1976 : Community of Six

Years 1977 to 1980 : Community of Nine

Community (vi)	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976
1) Falls of ground	0,253	0,242	0,235	0,217	0,234	0,217	0,175	0,177	0,208	0,192	0,160	0,176	0,155	0,133	0,092	0,13	0,11	0,10	0,07
2) Transport	0,147	0,141	0,146	0,168	0,124	0,167	0,178	0,149	0,160	0,128	0,115	0,143	0,132	0,104	0,141	0,12	0,08	0,11	0,08
3) Movement of personnel	0,057	0,063	0,047	0,056	0,045	0,060	0,043	0,051	0,060	0,044	0,054	0,038	0,039	0,043	0,043	0,04	0,05	0,047	0,08
4) Machinery, handling of tools and supports	0,011	0,028	0,012	0,021	0,037	0,013	0,030	0,024	0,023	0,024	0,017	0,023	0,027	0,029	0,019	0,02	0,02	0,047	0,05
5) Falling objects	0,045	0,027	0,024	0,041	0,062	0,046	0,037	0,037	0,030	0,036	0,040	0,031	0,025	0,041	0,038	0,02	0,04	0,038	0,04
6) Explosives	0,009	0,010	0,002	-	0,002	0,001	0,002	0,002	0,001	0,002	0,006	-	0,002	0,005	-	-	-	-	0,008
7) Explosions of firedamp and dust	0,032	0,036	0,002	-	0,375	0,001	0,001	0,053	0,030	-	0,044	-	0,037	0,005	-	-	0,13	-	0,08
8) Gas outbursts, suffocation by natural gases	0,016	0,010	0,006	0,003	0,007	0,005	0,002	0,006	0,004	0,012	0,006	0,004	-	0,027	0,022	0,012	-	-	0,008
9) Fires & spontaneous combustion	-	0,003	-	0,001	-	0,003	0,003	0,003	-	-	-	-	-	0,003	-	-	-	-	-
10) Inrushes	0,002	0,002	0,001	0,006	0,005	0,005	-	0,001	-	0,002	-	-	0,011	-	0,003	0,003	-	-	-
11) Electricity	0,016	0,007	0,007	0,004	0,008	0,008	0,003	0,004	0,003	0,004	0,006	0,006	0,004	-	0,003	0,003	-	-	0,003
12) Other causes	0,023	0,021	0,024	0,029	0,032	0,021	0,014	0,013	0,017	0,015	0,012	0,015	0,016	0,053	0,035	0,06	0,02	0,003	0,07
TOTAL	0,610	0,590	0,507	0,546	0,932	0,547	0,492	0,522	0,536	0,457	0,460	0,438	0,429	0,440	0,399	0,413	0,456	0,35	0,42

Community	1977	1978	1979	1980
1) Falls of ground	0,05	0,08	0,04	0,07
2) Transport	0,08	0,11	0,08	0,10
3) Movement of personnel	0,02	0,02	0,03	0,03
4) Machinery, handling of tools & supports	0,02	0,02	0,01	0,02
5) Falling objects	0,01	0,01	0,02	0,02
6) Explosives	0,01	0,00	0	-
7) Explosions of firedamp and dust	-	-	0,03	0,00
8) Gas outbursts, suffocation by natural gases	-	-	-	-
9) Fires & spontaneous combustion	0,01	-	-	-
10) Inrushes	-	-	-	0,01
11) Electricity	0,01	-	0,01	0,01
12) Other causes	-	-	-	-
TOTAL	0,20	0,25	0,24	0,25

C. Comparative table of underground group accidents (1) for
the Community of Six
Years 1960 to 1980

YEAR	NUMBER OF ACCIDENTS	CAUSE	INJURED	DEATHS
1960	2	Falls of ground	2	10
1961	1	Falls of ground	0	7
1962	3	Falls of ground	3	18
	3	Firedamp and dust explosions	62	338
1963	-	-	-	-
1964	2	Transport	5	14
1965	3	Firedamp and dust explosions	4	41
1966	3	Firedamp and dust explosions	11	21
1967	-	-	-	-
1968	1	Firedamp and dust explosions	0	17
1969	1	Falls of ground	0	6
	1	Movement of personnel	0	5
1970	1	Firedamp and dust explosions	11	16
1971	2	Falls of ground	0	12
	1	Gas outbursts, suffocation by natural gases	1	8
1972	-	-	-	-
1973	2	Falls of ground	-	9
1974	1	Falls of ground	1	5
	1	Firedamp and dust explosions	5	42
1975	-	-	-	-
1976	1	Firedamp and dust explosions	0	16
1977	1	Fires and spontaneous combustion	7	7
1978	1	Transport	3	7
1979	1	Falls of ground	0	5
	2	Firedamp and dust explosions	2	17
1980	1	Firedamp and dust explosio-s	16	2

(1) Group accidents: accidents involving more than five persons killed or incapacitated for work for longer than 56 days.

D. SUMMARY TABLE

1. COMMUNITY OF SIX

Years 1958 - 1975

Year	Production in thousands of tonnes (1)	Underground o.m.s. in kg/hour	Million hours worked	Number of deaths	No of serious injuries (2) (more than 8 weeks)	No of deaths per million tonnes	No of serious injuries (2) per million tonnes	No of deaths per million hours	No of serious injuries per million hours
1958	252 278	200	1 260	770	17 074	3.052	67.68	0.610	13.551
1959	240 602	214	1 122	622	14 539	2.585	60.43	0.590	12.950
1960	239 967	231	1 037	526	13 459	2.192	56.09	0.507	12.988
1961	235 848	245	962	527	12 720	2.235	53.93	0.548	13.227
1962	233 233	259	901	840 (3) 541 (4)	12 418	3,602(3) 2,320(4)	53.24	0,932(3) 0,600(4)	13,781
1963	229 769	270	849	465	11 686	2,024	50.86	0,547	13,761
1964	235 007	279	841	411	11 726	1,749	49.89	0,493	13,860
1965	224 249	286	784	410	10 595	1,828	47.25	0,522	13,506
1966	210 189	301	698	374	9 247	1,779	43.99	0,536	13,242
1967	189 484	322	587	269	7 781	1,420	41.06	0,457	13,246
1968	181 016	346	522	240	7 501	1,326	41.44	0,460	14,370
1969	176 749	371	476	209	7 222	1,181	40.82	0,438	15,160
1970	170 355	388	438	188	6 591	1,104	38.69	0,429	15,047
1971	164 910	398	414	182	6 249	1,104	37.89	0,440	15,088
1972	151 809	411	369	147	5 763	1,033	26.34	0,399	15,60
1973	139 700	421	332	137	5 560	0,981	39.80	0,413	16,77
1974	133 300	426	313	143	5 054	1,073	37.91	0,456	16,12
1975	129 100	405	319	110	4 795	0,852	37.14	0,35	15,05

- (1) net output including slurry and dust.
 (2) persons incapacitated for more than 56 days.
 (3) including the Luisenthal explosion.
 (4) excluding the Luisenthal explosion.

2. ROYAUME-UNI

Years 1973 - 1975

1973	130 200	425	306	74	490	0,568	3,76	0,242	1,60
1974	109 200	407	268	37	417	0,339	3,82	0,138	1,555
1975	127 700	421	303	55	522	0,431	4,09	0,181	1,722

Important note: The figures for serious injuries in these two tables cannot be compared as the corresponding definition in the U.K. differed from that used in the Community for the years 1973 to 1975. From 1976 onwards, all figures are based on the same definition and are given in Table D3 which covers the Community of Nine.

3. COMMUNITY OF IX
 Years 1976-1980

Year	Production in thousands of tonnes	Underground o.m.s. in kg/hour	Million hours worked	Number of deaths	N° of serious injuries (more than 8 weeks)	N° of deaths per million tonnes	N° of serious injuries per million tonnes	N° of deaths per million hours	N° of serious injuries per million hours
1976	247 700	421	588	170	6 898	0,686	27,85	0,289	11,73
1977	246 770	427	578	116	6 637	0,470	26,90	0,201	11,48
1978	238 078	427	557	138	6 472	0,580	27,18	0,248	11,62
1979	238 608	428	557	131	5 992	0,549	25,11	0,235	10,76
1980	247 090	437	565	141	5 583	0,571	22,60	0,250	9,88

E. ACCIDENT LEVELS SINCE 1971 (COMMUNITY OF THE SIX)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
4-20 days - actual	47 203	40 376	37 384	34 797	33 985	30 643	29 466	27 602	26 325	26 693
Frequency rate	113,96	109,31	112,77	110,97	106,67	101,77	103,90	102,15	99,86	100,87
increase/decrease on previous year o/o	-	- 4 (s)	+ 3,17 (s)	- 1,6 (s)	- 3,9 (s)	- 4,8 (s)	+ 2,1(s)	- 1,7(s)	- 2,2(s)	+ 1,0
21 - 56 days - actual	21 116	18 531	17 325	15 875	15 454	13 923	13 388	13 240	12 779	12 820
Frequency rate	50,98	50,17	52,26	50,62	48,5	46,24	47,21	49,00	47,95	48,45
increase/decrease on previous year o/o	-	- 1,59	+ 4,17	- 3 (s)	- 4,2 (s)	- 4,8 (s)	+ 2,1	+ 3,7 (s)	- 2,1	+ 1,1
more than 56 days - actual	6 249	5 763	5560	5 054	4 795	4 791	4 357	4 443	4 380	4 108
frequency rate	15,09	15,60	16,77	16,12	15,05	14,92	15,36	16,44	16,43	15,52
increase/decrease on previous year o/o	-	+ 3,4 (s)	+ 7 (s)	- 4 (s)	- 6,7 (s)	- 0,8	+ 2,9	+ 6,6 (s)	- 0,06	- 5,9 (s)
Fatalities total - actual	182	147	137	143	110	125	83	95	91	103
frequency rate	0,440	0,399	0,413	0,456	0,345	0,415	0,293	0,352	0,341	0,389
increase/decrease on previous year o/o	-	- 10	+ 3,9	+ 10,4	- 24	+ 20	+ 29,4(s)	+ 20,1	- 4,2	+ 14,1
actual without group accident.	162	141	128	96	110	109	66	95	81	101
frequency rate	0,391	0,382	0,385	0,307	0,345	0,362	0,233	0,352	0,304	0,382
increase/decrease on previous year o/o	-	- 2,3	+ 1 %	- 21 (s)	+ 12	+ 4,9	- 39,4 (s)	+ 51,1 (s)	- 13,6	+ 25,7 (s)

(s) significant variation

A. Comparative table of the number of persons incapacitated by accidents for longer than 56 days

Frequency rates
Years 1958 to 1980

GERMANY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1) Falls of ground	4,843	4,779	4,886	4,797	4,682	4,663	4,894	4,732	4,721	4,524	4,618	4,736	4,321	4,354	4,20	4,30	4,08	3,69	3,47	3,67
2) Haulage and transport	2,550	2,569	2,445	2,458	2,501	2,433	2,385	2,411	2,067	1,913	1,994	2,195	2,007	1,724	1,81	1,80	1,68	2,16	1,89	1,74
3) Movement of personnel	2,497	2,463	2,348	2,512	2,608	2,646	2,744	3,032	2,852	2,974	3,300	3,399	3,370	3,246	3,48	3,98	4,15	3,37	3,58	4,09
4) Machinery, handling of tools and supports	0,767	0,914	0,920	0,867	1,046	1,213	1,242	1,234	1,244	1,124	1,396	1,291	1,382	1,597	1,38	1,61	1,58	2,16	1,85	2,09
5) Falling objects	2,537	2,719	2,738	2,945	3,077	3,038	3,242	3,344	3,272	3,642	3,773	4,036	4,166	3,313	3,49	3,49	3,37	2,97	2,92	3,03
6) Explosives	0,015	0,011	0,010	0,009	0,008	0,006	0,006	0,005	0,005	0,017	0,011	0,007	0,008	-	-	-	0,01	-	0,01	-
7) Explosions of firedamp or coal dust	0,011	0,016	-	0,002	0,123	0,010	-	0,014	0,013	-	0,004	0,004	-	0,012	-	-	-	-	0,02	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-	-	-	-	-	0,005	-	0,003	-	-	-	-	-	-	-	-	-	-
9) Underground combustion and fires	-	-	0,003	0,002	-	-	-	-	-	-	0,004	-	-	-	-	-	-	-	-	-
10) Inrushes of water	0,004	-	-	-	-	0,004	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11) Electricity	0,010	0,014	0,012	0,014	0,006	0,012	0,009	0,002	0,010	0,006	0,011	0,026	0,012	0,008	0,01	0,005	-	0,009	0,01	0,01
12) Other causes	0,487	0,522	0,457	0,503	0,488	0,473	0,477	0,354	0,414	0,396	0,429	0,402	0,532	0,632	0,96	0,99	0,52	0,32	0,40	0,36
TOTAL	13,721	14,007	13,819	14,109	14,539	14,499	14,999	15,133	14,598	14,599	15,540	16,096	15,798	14,886	15,31	16,19	15,40	14,69	14,16	14,93

GERMANY	1978	1979	1980
1) Falls of ground	3,48	3,51	2,99
2) Haulage and transport	1,77	1,71	1,72
3) Movement of personnel	4,17	4,63	4,49
4) Machinery, handling of tools and supports	1,90	1,85	1,67
5) Falling objects	3,34	3,54	3,38
6) Explosives	-	0,01	-
7) Explosions of firedamp or coal dust	-	0,01	0,08
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-
9) Underground combustion and fires	-	-	-
10) Inrushes of water	-	-	-
11) Electricity	0,01	0,07	0,01
12) Other causes	0,20	0,56	0,13
TOTAL	14,87	15,42	14,47

B. Comparative table of underground fatalities

Frequency rates
Years 1958 to 1980

GERMANY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1) Falls of ground	0,268	0,290	0,263	0,216	0,280	0,260	0,200	0,184	0,197	0,206	0,148	0,192	0,113	0,147	0,10	0,08	0,12	0,12	0,06	0,07
2) Haulage and transport	0,179	0,169	0,182	0,196	0,149	0,178	0,300	0,191	0,175	0,150	0,126	0,143	0,128	0,103	0,16	0,13	0,07	0,12	0,10	0,08
3) Movement of personnel	0,094	0,097	0,070	0,086	0,059	0,089	0,071	0,070	0,094	0,076	0,079	0,056	0,058	0,032	0,06	0,06	0,06	0,06	0,07	0,05
4) Machinery, handling of tools and supports	0,010	0,027	0,012	0,027	0,037	0,019	0,028	0,025	0,030	0,020	0,014	0,034	0,031	0,032	0,03	0,02	0,02	0,05	0,03	0,04
5) Falling objects	0,065	0,041	0,039	0,065	0,072	0,072	0,054	0,058	0,048	0,063	0,051	0,049	0,035	0,047	0,06	0,02	0,04	0,05	0,05	0,02
6) Explosives	0,009	0,003	0,003	-	0,004	-	0,002	-	-	-	0,004	-	-	-	-	-	-	-	0,005	-
7) Explosions of firedamp or coal dust	0,011	0,012	-	-	0,660	0,002	0,002	0,019	0,056	-	0,061	-	-	0,008	-	-	-	-	0,01	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0,005	0,003	0,002	0,004	0,002	-	-	0,002	0,002	0,007	-	0,004	-	0,008	0,004	0,005	-	-	0,01	-
9) Underground combustion and fires	-	0,003	-	0,002	-	0,006	0,009	0,005	-	-	-	-	-	-	-	-	-	-	-	0,04
10) Inrushes of water	-	0,003	0,002	-	-	0,004	-	-	-	-	-	-	0,012	-	-	-	-	-	-	-
11) Electricity	0,022	0,008	0,002	0,005	0,010	0,002	0,004	0,005	-	0,003	0,004	0,004	0,004	-	0,004	0,005	-	-	0,005	0,01
12) Other causes	0,025	0,025	0,036	0,049	0,049	0,025	0,017	0,023	0,027	0,017	0,022	0,022	0,027	0,083	0,04	0,09	0,03	0,005	0,03	0,02
TOTAL	0,687	0,680	0,611	0,651	1,344	0,657	0,587	0,582	0,629	0,542	0,509	0,504	0,408	0,460	0,46	0,420	0,34	0,41	0,377	0,34

GERMANY	1978	1979	1980
1) Falls of ground	0,13	0,08	0,09
2) Haulage and transport	0,14	0,11	0,13
3) Movement of personnel	0,05	0,07	0,05
4) Machinery, handling of tools and supports	0,04	0,03	0,04
5) Falling objects	0,03	0,05	0,05
6) Explosives	-	-	-
7) Explosions of firedamp or coal dust	-	0,04	0,01
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-
9) Underground combustion and fires	-	-	-
10) Inrushes of water	-	-	-
11) Electricity	-	-	0,01
12) Other causes	0,01	0,01	0,02
TOTAL	0,40	0,40	0,39

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Common Statistics on victims
of accidents underground in coal mines

(absolute figures)

YEAR 1980

MAN-HOURS WORKED (1) 193.672.636

COUNTRY FEDERAL REPUBLIC OF GERMANY

SITE OF THE ACCIDENT CAUSES OF ACCIDENTS	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6		
	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	> 56 days (2)	Fatal acci- dents	total
I. FALLS OF GROUNDS AND ROCKS	1355	857	283	8	2503	1282	764	254	8	2308	13	16	10	-	39	252	134	32	1	419	2902	1771	579	17	5269	-	-	-
II. TRANSPORT, TOTAL	138	144	81	6	369	65	56	49	1	171	26	23	31	1	81	221	235	172	18	646	450	458	333	26	1267	-	-	-
a) Continuous Transport	42	56	38	1	137	25	14	17	-	56	1	2	-	-	3	17	20	13	1	51	85	92	68	2	247	-	-	-
b) Discontinuous Transport	96	88	43	5	232	40	42	32	1	115	25	21	31	1	78	204	215	159	17	5	365	366	265	24	1020	-	-	-
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	1622	1128	295	-	3045	1272	844	211	1	2328	166	129	36	6	337	1315	942	327	2	2586	4375	3043	869	9	8296	-	-	-
a) While moving about the mine	-	-	-	-	-	-	-	-	-	-	1	1	-	1	3	-	-	-	-	-	1	1	-	1	3	-	-	-
b) In the course of other activities	1622	1128	295	-	3045	1272	844	211	1	2328	165	128	36	5	334	1315	942	327	2	2586	4374	3042	869	8	8293	-	-	-
IV. MACHINES, TOOLS AND SUPPORTS TOTAL	689	492	165	4	1350	517	337	113	4	971	37	23	5	-	65	331	201	41	-	573	1574	1053	324	8	2959	-	-	-
a) Machines	126	106	55	2	289	79	66	36	2	183	13	9	3	-	25	71	56	15	-	142	289	237	109	4	639	-	-	-
b) Tools	288	143	31	-	462	263	137	34	-	434	23	13	2	-	38	205	104	18	-	327	779	397	85	-	1261	-	-	-
c) Supports	275	243	79	2	599	175	134	43	2	354	1	1	-	-	2	55	41	8	-	104	506	419	130	4	1059	-	-	-
V. FALLS OF OBJECTS	1435	886	330	2	2653	801	441	149	4	1395	76	43	20	1	140	669	355	155	3	1182	2981	1725	654	10	5370	-	-	-
VI. EXPLOSIVES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	4	2	16	2	24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4	2	16	2	24	16	2	24
VIII. OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO ₂ , CH ₄ , CO, H ₂ S), TOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
a) Outbursts of Gas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b) De-oxygenation and Poisoning by natural Gases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IX. HEATINGS OR FIRES	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-
X. INRUSHES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XI. ELECTRICITY	2	2	-	-	4	2	1	1	-	4	-	2	-	-	2	2	5	-	1	8	6	10	1	1	18	-	-	-
XII. OTHER CAUSES	102	31	10	1	144	62	36	6	1	105	4	4	1	-	9	61	30	9	1	101	229	101	26	3	359	-	-	-
TOTAL	5348	3542	1180	23	10093	4001	2479	783	19	7282	322	240	103	8	673	2851	1902	736	26	5515	12522	8163	2802	76	23563	-	-	-

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme.

(2) Accidents involving more than five casualties (i.e. who either died or were unable to resume work underground for at least eight weeks).

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Table 1b

Common Statistics on victims
of accidents underground in coal mines

(frequency rates)

YEAR 1980

MAN-HOURS WORKED (1) 193,672,636

COUNTRY FEDERAL REPUBLIC OF GERMANY

SITE OF THE ACCIDENT	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6		
	Period of incapacity																											
CAUSES OF ACCIDENTS	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	> 56 days (1)	Fatal acci- dents	total
I FALLS OF GROUNDS AND ROCKS	7,00	4,42	1,46	0,04	12,92	6,62	3,94	1,31	0,04	11,92	0,07	0,08	0,05	-	0,20	1,30	0,69	0,17	0,01	2,16	14,98	9,14	2,99	0,09	27,21	-	-	-
II TRANSPORT. TOTAL	0,71	0,74	0,42	0,03	1,91	0,34	0,29	0,25	0,01	0,88	0,13	0,12	0,16	0,01	0,42	1,14	1,21	0,89	0,09	3,34	2,32	2,36	1,72	0,13	6,54	-	-	-
a) Continuous Transport	0,22	0,29	0,20	0,01	0,71	0,13	0,07	0,09	-	0,29	0,01	0,01	-	-	0,02	0,09	0,10	0,07	0,01	0,26	0,44	0,48	0,35	0,01	1,28	-	-	-
b) Discontinuous Transport	0,50	0,45	0,22	0,03	1,20	0,21	0,22	0,17	0,01	0,59	0,13	0,11	0,16	0,01	0,40	1,05	1,11	0,82	0,09	3,07	1,88	1,89	1,37	0,12	5,27	-	-	-
III FALLS AND MOVEMENT OF THE VICTIM. TOTAL	8,37	5,82	1,52	-	15,72	6,57	4,36	1,09	0,01	12,02	0,86	0,67	0,19	0,03	1,74	6,79	4,86	1,69	0,01	13,35	22,59	15,71	4,49	0,05	42,84	-	-	-
a) While moving about the mine	-	-	-	-	-	-	-	-	-	-	0,01	0,01	-	0,01	0,02	-	-	-	-	-	0,01	0,01	-	0,01	0,02	-	-	-
b) In the course of other activities	8,37	5,82	1,52	-	15,72	6,57	4,36	1,09	0,01	12,02	0,85	0,66	0,19	0,03	1,72	6,79	4,86	1,69	0,01	13,35	22,58	15,71	4,49	0,04	42,82	-	-	-
IV MACHINES, TOOLS AND SUPPORTS TOTAL	3,56	2,54	0,85	0,02	6,97	2,67	1,74	0,58	0,02	5,01	0,19	0,12	0,03	-	0,34	1,71	1,04	0,21	-	2,96	8,13	5,44	1,67	0,04	15,28	-	-	-
a) Machines	0,65	0,55	0,28	0,01	1,49	0,41	0,34	0,19	0,01	0,94	0,07	0,05	0,02	-	0,13	0,37	0,29	0,08	-	0,73	1,49	1,22	0,56	0,02	3,30	-	-	-
b) Tools	1,49	0,74	0,16	-	2,39	1,36	0,71	0,18	-	2,24	0,12	0,07	0,01	-	0,20	1,06	0,54	0,09	-	1,69	4,02	2,05	0,44	-	6,51	-	-	-
c) Supports	1,42	1,25	0,41	0,01	3,09	0,90	0,69	0,22	0,01	1,83	0,01	0,01	-	-	0,01	0,28	0,21	0,04	-	0,54	2,61	2,16	0,67	0,02	5,47	-	-	-
V FALLS OF OBJECTS	7,41	4,57	1,70	0,01	13,70	4,14	2,28	0,77	0,02	7,20	0,39	0,22	0,10	0,01	0,72	3,45	1,83	0,80	0,02	6,10	15,39	8,91	3,38	0,05	27,73	-	-	-
VI EXPLOSIVES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VII IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	0,02	0,01	0,08	0,01	0,12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,02	0,01	0,08	0,01	0,12	0,08	0,01	0,12
VIII OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO, CH ₄ , CO, H ₂ S). TOTAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
a) Outbursts of Gas	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b) De-oxygenation and Poisoning by natural Gases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IX HEATINGS OR FIRES	0,01	-	-	-	0,01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,01	-	-	-	0,01	-	-	-
X INRUSHES	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
XI ELECTRICITY	0,01	0,01	-	-	0,02	0,01	0,01	0,01	-	0,02	-	0,01	-	-	0,01	0,01	0,03	-	0,01	0,04	0,03	0,05	0,01	0,01	0,09	-	-	-
XII OTHER CAUSES	0,53	0,16	0,05	0,01	0,74	0,32	0,19	0,03	0,01	0,54	0,02	0,02	0,01	-	0,05	0,31	0,15	0,05	0,01	0,52	1,18	0,52	0,13	0,02	1,85	-	-	-
TOTAL	27,61	18,29	6,09	0,12	52,11	20,66	12,80	4,04	0,10	37,60	1,66	1,24	0,53	0,04	3,47	14,72	9,82	3,80	0,13	28,48	64,66	42,15	14,47	0,39	121,67	-	-	-

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme
(2) Accidents involving more than five casualties (i.e. who either died or were unable to resume work underground for at least eight weeks)

ANNEX

Explanatory notes - Tables 2

GENERAL DEFINITIONS

1. Accident

Bodily injury resulting from a sudden and abnormal external cause in the course of work.

The Mine Safety and Health Commission's statistics should only cover victims of accidents underground, including accidents which occur when men enter and leave the cages and while the cages are in motion.

2. Fatal accident

An accident causing the death of the victim within 56 days following the accident. Victims dying more than 56 days after the day of the accident should not be included in the fatal accidents category but in that of accidents resulting in incapacity involving an absence from work of more than 56 days.

3. Persons covered by the statistics

Pit staff and employees of contractor firms who belong to a miner's social security scheme.

The statistics count victims and not accidents; everyone who is the victim of an accident while actually underground as well as during descent and ascent should be included. Victims can therefore only be miners, supervisors, engineers or staff belonging to contractor firms.

4. Shifts and number of hours worked

Shifts and number of hours worked by the persons on the books of the mine and other staff belonging to a miners' social insurance scheme; account should be taken both of extra shifts and overtime.

The period of reference adopted is the period of actual exposure to risk; extra shifts and overtime must therefore be counted in terms of time actually worked and not of number of hours paid.

5. Accident rates

Number of accidents per million hours worked.

The frequency rates are arrived at by dividing the number of accidents of a given category by the total number of hours spent on all types of work underground.

9. Location of the injury

When an accident has resulted in multiple injuries to different parts of the body and one of the injuries is clearly more serious than the others, this accident should be classified in the group relating to the part of the body most seriously injured; for example, a fracture of the leg, together with grazing of a hand, should be classified in category VI "Lower limbs" and not in category V "Hands".

I. Head and neck

Covers in particular the skull, the scalp, brain injuries, the ears, the mouth (including the lips, teeth and tongue), the nose, the face, the neck but not the eyes which are included in category II.

II. Eyes

Also covers the eye socket and the optic nerve.

III. Trunk

Covers the back (vertebrae and adjacent muscles, the spinal marrow), the thorax (ribs, sternum, bronchi, lungs), the abdomen (including internal organs, kidneys, liver, spleen), the abdomen and the genital organs.

The shoulders and wrists are regarded as part of the upper limbs (category IV) and not of the trunk or hands (category V).

The hips and the ankles are regarded as part of the lower limbs (category VI) and not as part of the trunk or feet (category VII).

IV. Upper limbs (excluding the hands)

This includes injuries to the shoulders, including the collar bone and shoulder blades, injuries to the arms, elbows, forearms and wrists.

V. Hands

The wrists are not regarded as part of the hands but of the upper limbs (category IV).

VI. Lower limbs (excluding feet)

This includes the hips, thighs, knees, legs and ankles.

VII. Feet

The ankles are not regarded as part of the feet but of the lower limbs (category VI).

VIII. Multiple locations

This group, covering multiple locations, should only be used when the victim has suffered several injuries to different parts of his body, none of which is clearly more serious than the others.

The category may cover injuries to the head and trunk, the head and one or more limbs, the trunk and one or more limbs or an upper and a lower limb.

IX. Not specified

This group should only be used when there is no evidence of the exact location of the injury.

10. Nature of the injury

When an accident has resulted in several injuries to different parts of the body and one of them is clearly more serious than the others, the accident should be classified in the group relating to the most serious injury.

1. Amputations and enucleations

This includes traumatic avulsion of the eye.

2. Fractures with or without dislocation

This includes simple fractures; fractures with injuries to the soft parts of the body, closed or compound fractures; fractures with internal or nerve damage, fractures with luxations, contusions and crushings.

3. Luxations, twists and sprains

LUXATIONS

This covers minor luxations and dislocations, traumatic lumbago, lumbago sciatica caused by strain; it does not include luxations with fracture covered by category 2.

TWISTS AND SPRAINS

This covers ruptures, torn and lacerated muscles, tendons, ligaments and joints as well as hernia due to strain and slipped discs, except when they are associated with open wounds.

4. Concussion and internal injury

This category includes internal bruising, internal bleeding, internal lacerations and ruptures except where associated with fractures.

It does not include internal injuries accompanied by fractures which are covered by category 2.

5. Open wounds, contusions and muscular abrasions

This covers lacerations, flesh wounds, cuts, contusions, scalp wounds, loss of a nail or an ear, wounds with nerve injuries, haemarthrosis, haematoma and bruises, contusions and bruises with superficial wounds. It does not include traumatic amputation, enucleations or avulsion of an eye, which are covered by category 1, compound fractures, contusions and crushings accompanying a fracture which are covered by category 2, concussion covered by 4, burns with wounds covered by 6.

6. Burns and harmful effects of electricity and radiation

Covers burns from fire, boiling liquid, friction, chemical substances (external burns only), burns with wounds, electrocution, electric shock and burns caused by electricity, the effect of X-rays, radioactive substances, ultra violet rays and ionizing radiation.

It does not cover burns caused by the absorption of a corrosive or caustic substance which are classified in category 7.

7. Poisoning and suffocation

This category covers the effects of the injection, ingestion, absorption or inhalation of toxic, corrosive or caustic substances.

Asphyxiation or suffocation by compression or roof fall; asphyxiation due to the suppression or reduction of oxygen in the atmosphere, the entry of a foreign bodies into the respiratory system, to carbon monoxide or other toxic gases.

8. Multiple injuries or those not specified (including complications)

This category includes those cases in which the victim has suffered several injuries of different types, none of which is clearly more serious than the others, and those which are not covered in any other category.

It also covers the various early complications of injuries and pathological reactions, which, however, should only be classified in this group when the nature of the original injury is not known.

PERIOD OF INCAPACITY

Accidents should be broken down according to two periods of incapacity :

- accidents involving an absence of more than 56 calendar days
- fatal accidents.

The day of the accident does not count. The number of days of incapacity to be taken into consideration is defined by the effective absence of the miner from work.

A. Comparative table of the number of persons incapacitated by accidents for longer than 56 days

Frequency rates

Years 1958 to 1980

BELGIUM	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1) Falls of ground	5,911	4,294	4,324	4,071	4,439	4,432	4,417	3,574	3,568	3,850	3,676	5,075	4,673	3,989	4,6	4,02	3,99	2,79	2,77	2,55
2) Haulage and transport	4,132	2,979	2,709	2,770	3,331	3,565	3,419	2,866	3,269	2,960	3,220	3,169	3,018	3,365	2,8	3,33	2,43	2,39	2,98	2,21
3) Movement of personnel	1,354	0,998	1,008	1,062	1,136	1,066	0,961	0,771	0,936	0,903	1,122	1,186	1,144	1,496	1,3	1,41	1,70	1,29	1,06	0,93
4) Machinery, handling of tools and supports	2,804	2,085	2,386	2,097	2,461	2,414	2,310	2,126	2,146	2,265	1,903	2,353	1,801	2,469	1,7	2,58	2,18	1,66	1,81	1,55
5) Falling objects	0,414	0,371	0,354	0,301	0,445	0,547	0,397	0,292	0,349	0,459	0,358	1,244	1,242	1,870	1,5	1,44	1,84	1,46	1,63	1,16
6) Explosives	0,027	0,007	0,032	0,018	-	0,019	0,018	-	0,013	0,056	0,049	-	-	0,025	0,03	-	-	-	0,03	-
7) Explosions of firedamp or coal dust	-	-	-	-	-	-	0,009	0,031	-	-	-	0,019	-	-	-	-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0,011	-	-	-	-	-	-	-	0,013	-	-	-	-	-	-	-	-	-	-	-
9) Underground combustion and fires	-	-	-	-	-	-	-	0,021	-	-	-	-	-	-	-	-	-	-	-	-
10) Inrushes of water	-	-	-	-	0,010	-	-	-	-	-	-	-	-	0,025	-	-	-	-	-	-
11) Electricity	0,011	-	0,016	0,018	0,010	0,009	-	0,010	0,015	-	0,016	0,019	-	-	-	0,03	0,03	0,03	-	-
12) Other causes	0,260	0,255	0,260	0,301	0,351	0,198	0,268	0,333	0,362	0,278	0,228	0,175	0,195	0,324	0,2	0,36	0,41	0,06	0,17	0,07
TOTAL	14,924	10,989	11,089	10,638	12,161	12,250	11,799	10,024	10,669	10,771	10,572	13,240	12,097	13,563	12,13	13,16	12,61	9,71	10,47	8,49

87

BELGIUM	1978	1979	1980
1) Falls of ground	3,43	3,25	2,4
2) Haulage and transport	2,74	2,74	2,3
3) Movement of personnel	1,13	1,30	0,8
4) Machinery, handling of tools and supports	1,94	1,98	2,1
5) Falling objects	1,98	1,98	1,9
6) Explosives	-	-	-
7) Explosions of firedamp or coal dust	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-
9) Underground combustion and fires	-	-	-
10) Inrushes of water	0,00	-	-
11) Electricity	-	-	-
12) Other causes	0,16	0,25	0,4
TOTAL	11,37	11,51	9,8

B. Comparative table of underground fatalities

Frequency rates
Years 1958 to 1980

BELGIUM	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1) Falls of ground	0,223	0,213	0,299	0,266	0,246	0,264	0,222	0,239	0,324	0,264	0,179	0,214	0,268	0,100	0,08	0,21	0,06	0,03	0,07	0,03
2) Haulage and transport	0,101	0,124	0,157	0,168	0,142	0,245	0,166	0,166	0,187	0,180	0,114	0,097	0,170	0,125	0,18	0,21	0,06	0,16	0,03	0,07
3) Movement of personnel	0,011	0,027	0,008	0,035	0,010	0,057	0,028	0,011	0,025	-	0,033	-	-	0,049	0,03	-	0,03	-	0,07	0,03
4) Machinery, handling of tools and supports	0,005	0,014	0,016	0,027	0,047	-	0,018	0,052	0,025	0,028	0,065	-	-	0,025	-	0,03	-	0,09	0,03	0,03
5) Falling objects	0,016	-	0,008	-	0,010	0,019	0,018	-	-	-	0,016	-	-	-	0,03	-	0,03	-	0,03	-
6) Explosives	0,011	0,014	-	-	-	-	-	-	-	-	0,016	-	-	-	-	-	-	-	-	-
7) Explosions of firedamp or coal dust	-	-	0,016	-	-	-	-	0,011	-	-	-	-	-	-	-	-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0,016	0,014	-	-	0,047	-	-	0,041	0,013	-	-	-	-	0,025	0,18	0,06	-	-	-	-
9) Underground combustion and fires	-	0,007	-	-	-	-	-	0,011	-	-	-	-	-	-	-	-	-	-	-	-
10) Inrushes of water	0,011	-	-	0,044	0,047	0,019	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11) Electricity	0,021	-	0,024	-	-	0,009	0,009	0,011	-	0,014	0,033	0,019	0,024	-	-	-	-	-	-	-
12) Other causes	0,005	-	0,008	0,009	0,019	0,028	0,009	-	0,013	0,042	-	-	-	-	0,03	0,03	-	-	-	-
TOTAL	0,420	0,413	0,536	0,549	0,368	0,641	0,471	0,542	0,587	0,528	0,456	0,330	0,462	0,324	0,53	0,54	0,20	0,29	0,24	0,193

BELGIUM	1978	1979	1980
1) Falls of ground	0,04	0,04	0,1
2) Haulage and transport	0,16	0,25	0,2
3) Movement of personnel	-	0,04	0,0
4) Machinery, handling of tools and supports	0,04	-	0,0
5) Falling objects	-	-	0,0
6) Explosives	-	-	-
7) Explosions of firedamp or coal dust	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-
9) Underground combustion and fires	-	-	-
10) Inrushes of water	-	-	-
11) Electricity	-	-	0,0
12) Other causes	0,04	-	-
TOTAL	0,28	0,34	0,4

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Table 1a

Common Statistics on victims
of accidents underground in coal mines

(absolute figures)

YEAR 1980

MAN-HOURS WORKED (1) 24,222,080

COUNTRY BELGIUM

SITE OF THE ACCIDENT	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6			
	Period of incapacity	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	> 56 days (1)	Fatal acci- dents	total
I. FALLS OF GROUNDS AND ROCKS		1456	161	34	1	1652	844	101	20	1	966	40	3	1	0	44	169	21	3	0	193	2509	286	58	2	2855			
II. TRANSPORT, TOTAL		67	14	8	1	90	173	31	20	2	226	67	24	10	1	102	182	45	17	1	245	489	114	55	5	663			
a) Continuous Transport		52	12	7	1	72	57	10	5	0	72	1	1	0	0	2	40	8	2	0	50	150	31	14	1	196			
b) Discontinuous Transport		15	2	1	0	18	116	21	15	2	154	66	23	10	1	100	142	37	15	1	195	339	83	41	4	467			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL		123	15	4	0	142	314	53	10	0	377	74	9	3	1	87	180	22	3	0	205	691	99	20	1	811			
a) While moving about the mine		18	3	0	0	21	79	13	2	0	94	20	1	1	0	22	33	5	0	0	38	150	22	3	0	175			
b) In the course of other activities		105	12	4	0	121	235	40	8	0	283	54	8	2	1	65	147	17	3	0	167	541	77	17	1	636			
IV. MACHINES, TOOLS AND SUPPORTS TOTAL		569	82	25	0	676	589	80	21	1	691	42	3	1	0	46	208	23	3	0	234	1408	188	50	1	1647			
a) Machines		70	17	2	0	89	49	6	3	0	58	5	0	0	0	5	13	9	2	0	24	137	32	7	0	176			
b) Tools		135	12	5	0	152	151	13	5	0	169	23	1	1	0	25	80	6	1	0	87	389	32	12	0	433			
c) Supports		364	53	18	0	435	389	61	13	1	464	14	2	0	0	16	115	8	0	0	123	882	124	31	1	1038			
V. FALLS OF OBJECTS		518	78	16	0	612	593	85	18	0	696	99	17	3	0	119	290	35	8	0	333	1500	215	45	0	1760			
VI. EXPLOSIVES		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
VIII. OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO ₂ , CH ₄ , CO, H ₂ S), TOTAL		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a) Outbursts of Gas		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
b) De-oxygenation and Poisoning by natural Gases		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
IX. HEATINGS OR FIRES		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
X. INRUSHES		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
XI. ELECTRICITY		2	1	0	0	3	2	1	0	0	3	1	0	0	0	1	0	0	0	1	1	5	2	0	1	8			
XII. OTHER CAUSES		55	3	4	0	62	75	2	2	0	79	29	2	1	0	32	60	7	2	0	69	219	14	9	0	242			
TOTAL		2790	354	91	2	3237	2590	353	91	4	3038	352	58	19	2	431	1089	153	36	2	1280	6821	918	237	10	7986			

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme.

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Table 1b

Common Statistics on victims
of accidents underground in coal mines

(frequency rates)

YEAR 1980

MAN-HOURS WORKED (1) 24,222,080

COUNTRY BELGIUM

SITE OF THE ACCIDENT CAUSES OF ACCIDENTS	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6		
	Period of incapacity																											
	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	> 56 days (2)	Fatal acci- dents	total
I FALLS OF GROUNDS AND ROCKS	60,1	6,6	1,4	0,0	68,2	34,8	4,2	0,8	0,0	39,9	1,7	0,1	0,0	0,0	1,8	7,0	0,9	0,1	0,0	8,0	103,6	11,8	2,4	0,1	117,9			
II TRANSPORT, TOTAL	2,8	0,6	0,3	0,0	3,7	7,1	1,3	0,8	0,1	9,3	2,8	1,0	0,4	0,0	4,2	7,5	1,9	0,7	0,0	10,1	20,2	4,7	2,3	0,2	27,4			
a) Continuous Transport	2,1	0,5	0,3	0,0	3,0	2,4	0,4	0,2	0,0	3,0	0,0	0,0	0,0	0,0	0,1	1,7	0,3	0,1	0,0	2,1	6,2	1,3	0,6	0,0	8,1			
b) Discontinuous Transport	0,6	0,1	0,0	0,0	0,7	4,8	0,9	0,6	0,1	6,4	2,7	0,9	0,4	0,0	4,1	5,9	1,5	0,6	0,0	8,1	14,0	3,4	1,7	0,2	19,3			
III FALLS AND MOVEMENT OF THE VICTIM, TOTAL	5,1	0,6	0,2	0,0	5,9	13,0	2,2	0,4	0,0	15,6	3,1	0,4	0,1	0,0	3,6	7,4	0,9	0,1	0,0	8,5	28,5	4,1	0,8	0,0	33,5			
a) While moving about the mine	0,7	0,1	0,0	0,0	0,9	3,3	0,5	0,1	0,0	3,9	0,8	0,0	0,0	0,0	0,9	1,4	0,2	0,0	0,0	1,6	6,2	0,9	0,1	0,0	7,2			
b) In the course of other activities	4,3	0,5	0,2	0,0	5,0	9,7	1,7	0,3	0,0	11,7	2,2	0,3	0,1	0,0	2,7	6,1	0,7	0,1	0,0	6,9	22,3	3,2	0,7	0,0	26,3			
IV MACHINES, TOOLS AND SUPPORTS TOTAL	23,5	3,4	1,0	0,0	27,9	24,3	3,3	0,9	0,0	28,5	1,7	0,1	0,0	0,0	1,9	8,6	0,9	0,1	0,0	9,7	58,1	7,8	2,1	0,0	68,0			
a) Machines	2,9	0,7	0,1	0,0	3,7	2,0	0,2	0,1	0,0	2,4	0,2	0,0	0,0	0,0	0,2	0,5	0,4	0,1	0,0	1,0	5,7	1,3	0,3	0,0	7,3			
b) Tools	5,6	0,5	0,2	0,0	6,3	6,2	0,5	0,2	0,0	7,0	0,9	0,0	0,0	0,0	1,0	3,3	0,2	0,0	0,0	3,6	16,1	1,3	0,5	0,0	17,9			
c) Supports	15,0	2,2	0,7	0,0	18,0	16,1	2,5	0,5	0,0	19,2	0,6	0,1	0,0	0,0	0,7	4,7	0,3	0,0	0,0	5,1	36,4	5,1	1,3	0,0	42,9			
V FALLS OF OBJECTS	21,4	3,2	0,7	0,0	25,3	24,5	3,5	0,7	0,0	28,7	4,1	0,7	0,1	0,0	4,9	12,0	1,4	0,3	0,0	13,7	61,9	8,9	1,9	0,0	72,7			
VI EXPLOSIVES	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0			
VII IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0			
VIII OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO ₂ , CH ₄ , CO, H ₂ S), TOTAL	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0			
a) Outbursts of Gas	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0			
b) De-oxygenation and Poisoning by natural Gases	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0			
IX HEATINGS OR FIRES	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0			
X INRUSHES	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0			
XI ELECTRICITY	0,1	0,0	0,0	0,0	0,1	0,1	0,0	0,0	0,0	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,2	0,1	0,0	0,0	0,3			
XII OTHER CAUSES	2,3	0,1	0,2	0,0	2,6	3,1	0,1	0,1	0,0	3,3	1,2	0,1	0,0	0,0	1,3	2,5	0,3	0,1	0,0	2,8	9,0	0,6	0,4	0,0	10,0			
TOTAL	115,2	14,6	3,8	0,1	133,6	106,9	14,6	3,8	0,2	125,4	14,5	2,4	0,8	0,1	17,8	45,0	6,3	1,5	0,1	52,8	281,6	37,9	9,8	0,4	329,7			

06

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme.

(2) Accidents involving more than five casualties (i.e. when either staff or wage-earners liable to register work underground for at least eight weeks).

DETAILED BREAKDOWN OF VICTIMS ACCORDING TO LOCATION
AND NATURE OF INJURY AND PERIOD OF INCAPACITY

Common Statistics on victims
of accidents underground in coal mines

(absolute figures)

YEAR 1980

MAN-HOURS WORKED (1) 24,222,080

COUNTRY **BELOIUM**

NATURE OF THE INJURY	Amputations and enucleations			Fractures with or without dislocation			Luxations, twist and sprains			Concussion and internal injury			Open wounds, contusion and muscular abrasions			Burns and harmful effects of electricity and radiation			Poisoning and suffocation			Multiple injuries of those not specified (2)			TOTAL								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27						
PERIOD OF INCAPACITY	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total							
LOCATION OF THE INJURY																																	
I. Head and neck	0	0	0	4	4	8	0	0	0	1	0	1	6	0	6	0	0	0				0	0	0							11	4	15
II. Eyes	1	0	1							0	0	0	8	0	8	0	0	0				1	0	1							10	0	10
III. Trunk	0	1	1	4	0	4	2	0	2	0	0	0	2	1	3	0	0	0				0	1	1							8	3	11
IV. Upper limbs (excluding the hands) (2)	0	0	0	16	0	16	0	0	0				15	0	15	0	0	0				0	0	0							31	0	31
V. Hands	5	0	5	40	0	40	0	0	0				21	0	21	0	0	0				0	0	0							66	0	66
VI. Lower limbs (excluding feet) (4)	1	0	1	32	0	32	2	0	2				31	0	31	0	0	0				0	0	0							66	0	66
VII. Feet	3	0	3	22	0	22	0	0	0				13	0	13	0	0	0				0	0	0							38	0	38
VIII. Multiple locations	0	0	0	2	0	2	0	0	0	0	0	0	5	2	7	0	1	0				0	0	0							7	3	10
IX. Not specified													0	0	0	0	0	0	0	0	0	0	0	0							0	0	0
TOTAL	10	1	11	120	4	124	4	0	4	1	0	1	101	3	104	0	1	1	0	0	0	1	1	2							237	10	247

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miner's social insurance scheme.

(4) The hips and the ankles are included under 'Lower limbs'.

A. Comparative table of the number of persons incapacitated by accidents for longer than 56 days

Frequency rates
Years 1958 to 1980

FRANCE *	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1) Falls of ground	5,027	4,665	4,744	4,416	4,222	4,177	4,308	3,941	3,927	3,634	4,162	4,044	3,761	3,721	3,79	4,38	4,52	3,75	3,82	3,88
2) Haulage and transport	1,980	1,695	1,920	2,106	2,196	2,366	2,278	2,153	1,858	1,918	1,946	1,556	1,666	1,959	1,89	2,37	2,36	2,63	2,53	2,44
3) Movement of personnel	1,505	1,118	2,873	2,334	2,458	2,368	2,383	2,087	2,239	2,174	2,815	3,226	3,372	3,667	4,51	4,79	4,11	4,29	4,81	5,39
4) Machinery, handling of tools and supports	0,914	1,022	1,621	2,523	2,991	3,096	3,042	2,272	2,639	2,773	3,016	3,070	3,332	2,373	2,63	2,84	2,98	2,94	3,17	3,13
5) Falling objects	1,890	2,187	1,893	2,292	2,073	2,278	2,074	1,839	1,785	2,114	2,386	2,537	2,515	4,566	4,96	5,00	5,12	4,11	4,11	3,94
6) Explosives	0,043	0,051	0,031	0,017	0,051	0,009	0,013	0,037	0,010	0,011	-	0,050	0,016	-	0,02	-	-	0,03	-	0,03
7) Explosions of firedamp or coal dust	0,047	0,088	-	-	0,004	-	-	-	0,029	-	-	-	0,087	-	-	-	0,08	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0,004	-	-	-	-	-	-	-	-	0,005	-	-	-	-	-	-	-	0,01	-	0,02
9) Underground combustion and fires	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,01	0,03	0,01	0,01	-
10) Inrushes of water	-	-	-	-	-	-	0,018	-	0,005	-	0,006	-	0,032	-	0,01	0,04	-	-	-	-
11) Electricity	0,014	-	0,004	0,029	0,004	0,014	0,009	0,014	-	0,005	0,006	0,014	0,024	0,009	0,01	-	9,01	0,03	0,03	0,02
12) Other causes	2,956	2,768	0,793	0,362	0,240	0,354	0,227	0,174	0,200	0,185	0,233	0,291	0,294	0,314	0,43	0,67	0,63	0,64	0,49	0,47
TOTAL	14,380	13,594	13,909	14,079	14,239	14,660	14,347	12,517	12,692	12,819	14,570	14,788	15,099	16,609	18,24	20,09	19,85	18,44	18,97	19,31

FRANCE *	1978	1979	1980
1) Falls of ground	4,88	4,86	4,32
2) Haulage and transport	3,11	2,68	3,47
3) Movement of personnel	7,43	6,34	7,30
4) Machinery, handling of tools and supports	3,52	3,22	3,32
5) Falling objects	3,86	4,22	3,25
6) Explosives	0,05	-	-
7) Explosions of firedamp or coal dust	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0,05	-	-
9) Underground combustion and fires	-	-	-
10) Inrushes of water	0,03	0,04	0,02
11) Electricity	0,03	-	0,02
12) Other causes	0,63	0,78	1,18
TOTAL	23,60	22,14	22,88

* Including Provence as from 1970.

B. Comparative table of underground fatalities

Frequency rates
Years 1958 to 1980

FRANCE *	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977
1) Falls of ground	0,235	0,192	0,186	0,219	0,167	0,120	0,127	0,164	0,214	0,139	0,177	0,149	0,143	0,117	0,07	0,20	0,11	0,06	0,08	0,08
2) Haulage and transport	0,115	0,085	0,082	0,122	0,077	0,121	0,141	0,052	0,126	0,088	0,101	0,186	0,127	0,108	0,08	0,07	0,12	0,07	0,10	0,08
3) Movement of personnel	0,007	0,018	0,027	0,008	0,043	0,009	0,009	0,042	0,024	0,016	0,025	0,014	0,016	0,072	0,01	0,01	0,01	0,03	0,03	-
4) Machinery, handling of tools and supports	0,018	0,040	0,016	0,008	0,030	0,009	0,036	0,009	0,015	0,016	0,006	-	0,032	0,027	-	0,02	0,03	-	0,10	-
5) Falling objects	0,025	0,007	0,004	0,017	0,030	0,009	0,018	0,019	0,015	0,011	0,031	0,014	0,016	0,045	-	0,04	0,03	0,03	0,03	0,07
6) Explosives	-	0,026	-	-	-	0,005	0,005	0,009	0,005	0,005	0,006	-	0,108	0,018	-	-	-	-	0,01	-
7) Explosions of firedamp or coal dust	0,115	0,121	-	-	0,004	-	-	0,155	-	-	0,038	-	0,127	-	-	-	0,58	-	0,23	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0,043	0,026	0,019	0,004	-	0,019	0,009	-	0,005	0,027	0,019	0,007	-	0,072	-	0,01	-	-	-	-
9) Underground combustion and fires	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0,01	-	0,01	-	-	-
10) Inrushes of water	-	-	-	0,004	-	-	-	0,005	-	0,005	-	-	0,016	-	0,01	-	-	-	-	-
11) Electricity	-	0,011	0,012	-	0,009	0,024	-	-	0,010	-	-	0,007	-	-	-	-	-	-	-	-
12) Other causes	0,036	0,029	0,008	-	0,009	0,014	0,014	-	0,005	0,005	-	0,007	-	0,009	0,03	-	-	-	-	0,07
TOTAL	0,594	0,555	0,354	0,382	0,369	0,330	0,359	0,455	0,419	0,332	0,403	0,384	0,484	0,468	0,21	0,37	0,89	0,18	0,80	0,19

FRANCE *	1978	1979	1980
1) Falls of ground	0,14	0,06	0,15
2) Haulage and transport	0,05	0,04	0,11
3) Movement of personnel	-	0,02	0,06
4) Machinery, handling of tools and supports	0,02	0,02	0,02
5) Falling objects	0,00	0,02	-
6) Explosives	0,02	-	-
7) Explosions of firedamp or coal dust	0,00	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-
9) Underground combustion and fires	-	-	-
10) Inrushes of water	-	-	-
11) Electricity	-	-	-
12) Other causes	-	0,02	0,02
TOTAL	0,23	0,15	0,36

* Including Provence as from 1970

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Tabel 1a

Common Statistics on victims
of accidents underground in coal mines

(absolute figures)

YEAR 1980

MAN-HOURS WORKED (1) 46.729.767

COUNTRY FRANCE

SITE OF THE ACCIDENT CAUSES OF ACCIDENTS	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6		
	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	> 56 days (2)	Fatal acci- dents	total
I. FALLS OF GROUNDS AND ROCKS	929	428	123	2	1482	367	184	55	5	611	2	1	0	0	3	159	57	24	0	240	1457	670	202	7	2336	0	0	0
II. TRANSPORT, TOTAL	105	77	35	0	217	73	32	24	0	129	7	7	7	0	21	211	177	96	5	489	396	293	162	5	856	0	0	0
a) Continuous Transport	47	42	17	0	106	18	9	4	0	31	1	0	1	0	2	22	17	17	0	56	88	68	39	0	195	0	0	0
b) Discontinuous Transport	58	35	18	0	111	55	23	20	0	98	6	7	6	0	19	189	160	79	5	433	308	225	123	5	661	0	0	0
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	866	474	100	1	1441	352	230	58	0	640	33	22	7	1	63	896	548	176	1	1621	2147	1274	341	3	3765	0	0	0
a) While moving about the mine	265	149	34	1	449	147	85	27	0	259	35	17	2	0	44	481	261	91	0	833	918	512	154	1	1585	0	0	0
b) In the course of other activities	601	325	66	0	992	205	145	31	0	381	8	5	5	1	19	415	287	85	1	788	1229	762	187	2	2180	0	0	0
IV. MACHINES, TOOLS AND SUPPORTS TOTAL	754	342	84	1	1181	354	150	31	0	535	9	6	1	0	16	355	189	35	0	583	1472	687	155	1	2315	0	0	0
a) Machines	61	45	18	0	124	85	38	13	0	136	1	0	0	0	1	34	22	7	0	63	181	105	38	0	324	0	0	0
b) Tools	360	127	28	0	515	170	59	8	0	237	5	4	0	0	9	221	105	17	0	343	756	295	53	0	1104	0	0	0
c) Supports	333	170	38	1	542	99	53	10	0	162	3	2	1	0	6	100	62	15	0	177	535	287	64	1	887	0	0	0
V. FALLS OF OBJECTS	467	218	61	0	746	252	94	33	0	379	19	10	2	0	31	544	299	56	0	899	1282	621	152	0	2055	0	0	0
VI. EXPLOSIVES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VIII. OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO, CH, CO, H ₂ S), TOTAL	2	1	0	0	3	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	3	2	0	0	5	0	0	0
a) Outbursts of Gas	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0
b) De-oxygenation and Poisoning by natural Gases	1	1	0	0	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	2	0	0	3	0	0	0
IX. HEATINGS OR FIRES	0	0	0	0	0	2	0	0	2	2	0	0	0	0	2	7	0	0	0	7	11	0	0	0	11	0	0	0
X. INRUSHES	11	0	1	0	12	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	12	0	1	0	13	0	0	0
XI. ELECTRICITY	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	2	3	1	0	6	4	3	1	0	8	0	0	0
XII. OTHER CAUSES	198	61	17	1	277	106	37	6	0	149	12	2	3	0	17	250	89	29	0	368	566	189	55	1	811	0	0	0
TOTAL	3332	1601	421	5	5359	1508	728	207	7	2448	83	48	20	1	154	2425	1362	417	6	4214	7350	3739	1069	17	12175	0	0	0

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Table 1b

Common Statistics on victims
of accidents underground in coal mines

(frequency rates)

YEAR 1980

COUNTRY FRANCE

MAN-HOURS WORKED (1) 46.729.767

SITE OF THE ACCIDENT CAUSES OF ACCIDENTS	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6		
	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal acci- dents	total	> 56 days (2)	Fatal acci- dents	total
I FALLS OF GROUNDS AND ROCKS	19,88	9,16	2,63	0,04	31,71	7,85	3,94	1,18	0,11	13,08	0,04	0,02	0,00	0,00	0,06	3,40	1,22	0,51	0,00	5,14	31,18	14,34	4,32	0,15	49,99	0,00	0,00	0,00
II TRANSPORT, TOTAL	2,25	1,65	0,75	0,00	4,64	1,56	0,68	0,51	0,00	2,76	0,15	0,15	0,15	0,00	0,45	4,52	3,79	2,05	0,11	10,46	8,47	6,27	3,47	0,11	18,32	0,00	0,00	0,00
a) Continuous Transport	1,01	0,90	0,36	0,00	2,27	0,39	0,19	0,09	0,00	0,66	0,02	0,00	0,02	0,00	0,04	0,47	0,36	0,36	0,00	1,20	1,88	1,46	0,83	0,00	4,17	0,00	0,00	0,00
b) Discontinuous Transport	1,24	0,75	0,39	0,00	2,38	1,18	0,49	0,43	0,00	2,10	0,13	0,15	0,13	0,00	0,41	4,04	3,42	1,69	0,11	9,27	6,59	4,81	2,63	0,11	14,15	0,00	0,00	0,00
III FALLS AND MOVEMENT OF THE VICTIM, TOTAL	18,53	10,14	2,14	0,02	30,84	7,53	4,92	1,24	0,00	13,70	0,71	0,47	0,15	0,02	1,35	19,17	11,73	3,77	0,02	34,69	45,95	27,26	7,30	0,06	80,57	0,00	0,00	0,00
a) While moving about the mine	5,67	3,19	0,73	0,02	9,61	3,15	1,82	0,58	0,00	5,54	0,75	0,36	0,04	0,00	0,94	10,29	5,59	1,95	0,00	17,83	19,64	10,96	3,30	0,02	33,92	0,00	0,00	0,00
b) In the course of other activities	12,86	6,95	1,41	0,00	21,23	4,39	3,10	0,66	0,00	8,15	0,17	0,11	0,11	0,02	0,41	8,88	6,14	1,82	0,02	16,86	26,30	16,31	4,00	0,04	46,65	0,00	0,00	0,00
IV MACHINES, TOOLS AND SUPPORTS TOTAL	16,14	7,32	1,80	0,02	25,27	7,58	3,21	0,66	0,00	11,45	0,19	0,13	0,02	0,00	0,34	7,60	4,04	0,75	0,00	12,48	31,50	14,70	3,32	0,02	49,54	0,00	0,00	0,00
a) Machines	1,31	0,96	0,39	0,00	2,65	1,82	0,81	0,28	0,00	2,91	0,02	0,00	0,00	0,00	0,02	0,73	0,47	0,15	0,00	1,35	3,87	2,25	0,81	0,00	6,93	0,00	0,00	0,00
b) Tools	7,70	2,72	0,60	0,00	11,02	3,64	1,26	0,17	0,00	5,07	0,11	0,09	0,00	0,00	0,19	4,73	2,25	0,36	0,00	7,34	16,18	6,31	1,13	0,00	23,63	0,00	0,00	0,00
c) Supports	7,13	3,64	0,81	0,02	11,60	2,12	1,13	0,21	0,00	3,67	0,06	0,04	0,02	0,00	0,13	2,14	1,33	0,32	0,00	3,79	11,45	6,14	1,37	0,02	18,98	0,00	0,00	0,00
V FALLS OF OBJECTS	9,99	4,67	1,31	0,00	15,96	5,39	2,01	0,71	0,00	8,11	0,41	0,21	0,04	0,00	0,66	11,64	6,40	1,20	0,00	19,24	27,43	13,29	3,25	0,00	43,98	0,00	0,00	0,00
VI EXPLOSIVES	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
VII IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
VIII OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO ₂ , CH ₄ , CO, H ₂ S), TOTAL	0,04	0,02	0,00	0,00	0,06	0,02	0,02	0,00	0,00	0,04	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,06	0,04	0,00	0,00	0,11	0,00	0,00	0,00
a) Outbursts of Gas	0,02	0,00	0,00	0,00	0,02	0,02	0,00	0,00	0,00	0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,04	0,00	0,00	0,00	0,04	0,00	0,00	0,00
b) De-oxygenation and Poisoning by natural Gases	0,02	0,02	0,00	0,00	0,04	0,00	0,02	0,00	0,00	0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,02	0,04	0,00	0,00	0,06	0,00	0,00	0,00
IX HEATINGS OR FIRES	0,00	0,00	0,00	0,00	0,00	0,04	0,00	0,00	0,04	0,04	0,00	0,00	0,00	0,00	0,04	0,15	0,00	0,00	0,00	0,15	0,24	0,00	0,00	0,00	0,24	0,00	0,00	0,00
X INRUSHES	0,24	0,00	0,02	0,00	0,26	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,02	0,00	0,00	0,00	0,02	0,26	0,00	0,02	0,00	0,28	0,00	0,00	0,00
XI ELECTRICITY	0,00	0,00	0,00	0,00	0,00	0,02	0,00	0,00	0,00	0,02	0,02	0,00	0,00	0,00	0,02	0,04	0,06	0,02	0,00	0,13	0,09	0,06	0,02	0,00	0,17	0,00	0,00	0,00
XII OTHER CAUSES	4,24	1,31	0,36	0,02	5,93	2,27	0,79	0,13	0,00	3,19	0,26	0,04	0,06	0,00	0,36	5,35	1,90	0,62	0,00	7,88	12,11	4,04	1,18	0,02	17,36	0,00	0,00	0,00
TOTAL	71,30	34,26	9,01	0,11	114,68	32,27	15,58	4,43	0,15	52,39	1,78	1,03	0,43	0,02	3,30	51,89	29,15	8,92	0,13	90,18	157,29	90,01	22,88	0,36	260,54	0,00	0,00	0,00

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme
(2) Accidents involving more than five casualties (i.e. when either death or severe incapacity to resume work is determined for at least eight weeks)

**DETAILED BREAKDOWN OF VICTIMS ACCORDING TO LOCATION
AND NATURE OF INJURY AND PERIOD OF INCAPACITY**

(absolute figures)

YEAR 1980

COUNTRY **FRANCE**

MAN-HOURS WORKED (1) **46.729.767**

NATURE OF THE INJURY	Amputations and enucleations			Fractures with or without dislocation			Luxations, twist and sprains			Concussion and internal injury			Open wounds, contusion and muscular abrasions			Burns and harmful effects of electricity and radiation			Poisoning and suffocation			Multiple injuries of those not specified (2)			TOTAL					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	
PERIOD OF INCAPACITY	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	
LOCATION OF THE INJURY																														
I. Head and neck	0	0	0	9	4	13	2	0	2	4	0	4	16	1	17	0	0	0				2	0	2	661	184	33	5	883	
II. Eyes	1	0	1							0	0	0	14	0	14	0	0	0				0	0	0	603	45	15	0	663	
III. Trunk	0	0	0	27	1	28	20	0	20	20	1	19	47	0	46	0	0	0				4	0	4	1101	665	118	2	1876	
IV. Upper limbs (excluding the hands) (2)	0	0	0	50	0	50	8	0	7				47	0	47	0	0	0				2	0	2	828	344	110	0	1282	
V. Hands	30	0	30	200	0	200	7	0	7				129	0	129	1	0	1				5	0	5	2007	1346	372	0	3725	
VI. Lower limbs (excluding feet) (4)	3	0	3	82	0	82	46	0	46				106	0	104	0	0	0				5	0	5	1109	588	246	0	1943	
VII. Feet	3	0	3	53	0	52	6	0	6				28	0	28	0	0	0				2	0	2	582	324	92	0	998	
VIII. Multiple locations	1	0	1	33	2	35	0	0	0	10	1	11	39	1	40	0	0	0				6	4	10	433	235	82	8	758	
IX. Not specified													0	1	1	0	0	0	0	0	0	0	1	1	26	18	1	2	47	
TOTAL	38	0	38	455	7	461	89	0	88	34	2	34	426	3	426	1	0	1	0	0	0	26	5	31	7350	3739	1069	17	12175	

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miner's social insurance scheme

(2) The hips and the ankles are included under "Lower limbs"

A. Comparative table of the number of persons incapacitated by accidents for longer than 56 days
Frequency rates
Years 1958 to 1980

United Kingdom	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	
1) Falls of ground																					1,05
2) Haulage and transport																					1,69
3) Movement of personnel																					2,03
4) Machinery, handling of tools and supports																					1,09
5) Falling objects	Not available following the system of classification used in the Community of the VI																				
6) Explosives																					0,01
7) Explosions of firedamp or coal dust																					-
8) Sudden outbursts of firedamp, suffocation by natural gases																					-
9) Underground combustion and fires																					-
10) Inrushes of water																					-
11) Electricity																					-
12) Other causes																					1,03
TOTAL																					7,75

United Kingdom	1978	1979	1980
1) Falls of ground	1,02	0,82	0,72
2) Haulage and transport	1,53	1,33	1,11
3) Movement of personnel	1,72	1,38	1,22
4) Machinery, handling of tools and supports	1,02	0,72	0,66
5) Falling objects	0,82	0,55	0,51
6) Explosives	0,01	0,01	0,00
7) Explosions of firedamp or coal dust	-	0,00	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-
9) Underground combustion and fires	-	-	-
10) Inrushes of water	-	0,00	-
11) Electricity	0,92	0,69	0,64
12) Other causes			
TOTAL	7,07	5,54	4,91

B. Comparative table of underground fatalities
Frequency rates
Years 1958 to 1980

United Kingdom	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	
1) Falls of ground																					0,02
2) Haulage and transport																					0,07
3) Movement of personnel																					-
4) Machinery, handling of tools and supports																					-
5) Falling objects																					-
6) Explosives																					-
7) Explosions of firedamp or coal dust	Not available following the system of classification used in the Community of the VI																				
8) Sudden outbursts of firedamp, suffocation by natural gases																					-
9) Underground combustion and fires																					-
10) Inrushes of water																					-
11) Electricity																					-
12) Other causes																					-
TOTAL																					0,11

United Kingdom	1978	1979	1980
1) Falls of ground	0,03	0,01	0,03
2) Haulage and transport	0,12	0,06	0,06
3) Movement of personnel	-	0,00	0,00
4) Machinery, handling of tools and supports	-	0,00	0,00
5) Falling objects	-	0,01	-
6) Explosives	-	-	-
7) Explosions of firedamp or coal dust	-	0,03	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-
9) Underground combustion and fires	-	-	-
10) Inrushes of water	-	-	-
11) Electricity	-	-	0,00
12) Other causes	-	0,00	-
TOTAL	0,15	0,13	0,12

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Common Statistics on victims
of accidents underground in coal mines

(absolute figures)

YEAR 1980

MAN-HOURS WORKED (1) 300 085 500

COUNTRY United Kingdom

SITE OF THE ACCIDENT CAUSES OF ACCIDENTS	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6		
	Period of incapacity					4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal accidents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal accidents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal accidents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal accidents	total	> 56 days (2)	Fatal accidents	total
I. FALLS OF GROUNDS AND ROCKS	1916	542	133	10	2601	608	164	47	2	821	0	0	0	0	0	576	179	39	0	794	3100	885	219	12	4216			
II. TRANSPORT, TOTAL	708	264	76	7	1055	246	66	23	0	335	6	2	0	0	8	2270	739	235	14	3258	3230	1071	334	21	4656			
a) Continuous Transport	50	18	9	2	79	16	6	2	0	24	0	0	0	0	0	149	51	15	3	218	215	75	26	5	321			
b) Discontinuous Transport	658	246	67	5	976	230	60	21	0	311	6	2	0	0	8	2121	688	220	11	3040	3015	996	308	16	4335			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	732	191	47	0	970	600	154	29	0	783	0	0	0	0	0	4770	1413	293	3	6479	6102	1758	369	3	8232			
a) While moving about the mine	193	50	13	0	256	167	31	5	0	203	0	0	0	0	0	2387	724	158	0	3269	2747	805	176	0	3728			
b) In the course of other activities	539	141	34	0	714	433	123	24	0	580	0	0	0	0	0	2383	689	135	3	3210	3355	953	193	3	4504			
IV. MACHINES, TOOLS AND SUPPORTS TOTAL	1463	353	82	1	1899	628	142	30	0	800	9	1	1	0	11	1674	457	88	0	2219	3774	953	201	1	4929			
a) Machines	272	63	18	1	354	56	22	4	0	82	1	0	0	0	1	126	27	7	0	160	455	112	29	1	597			
b) Tools	119	28	7	0	154	74	11	5	0	90	5	1	0	0	6	403	125	33	0	561	601	165	45	0	811			
c) Supports	1072	262	57	0	1391	498	109	21	0	628	3	0	1	0	4	1145	305	48	0	1498	2718	676	127	0	3521			
V. FALLS OF OBJECTS	995	309	54	0	1358	326	103	20	0	449	5	3	0	0	8	1214	344	82	0	1640	2540	759	156	0	3455			
VI. EXPLOSIVES	23	3	1	0	27	4	2	0	0	6	0	0	0	0	0	21	7	1	0	29	48	12	2	0	62			
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
VIII. OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO ₂ , CH ₄ , CO, H ₂ S), TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
a) Outbursts of Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
b) De-oxygenation and Poisoning by natural Gases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
IX. HEATINGS OR FIRES	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1			
X. INRUSHES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
XI. ELECTRICITY	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0	6	1	0	1	8	8	1	0	1	10			
XII. OTHER CAUSES	670	199	45	0	914	419	101	15	0	535	9	6	2	0	17	2548	673	132	0	3353	3646	979	194	0	4819			
TOTAL	6508	1861	438	18	8825	2832	733	164	2	3731	29	12	3	0	44	13079	3813	870	18	17780	22448	6419	1475	38	30380			

101

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme.

(2) Accidents involving more than five casualties (i.e. who either died or were unable to resume work underground for at least eight weeks)

DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE
OF ACCIDENT AND PERIOD OF INCAPACITY

Table 1b

Common Statistics on victims
of accidents underground in coal mines

(frequency rates)

YEAR 1980

MAN-HOURS WORKED (1) 300 085 500

COUNTRY United Kingdom

SITE OF THE ACCIDENT CAUSES OF ACCIDENTS	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6			
	Period of incapacity	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	4 to 20 days (1)	21 to 56 days (1)	> 56 days (1)	Fatal acci- dents	total	> 56 days (1)	Fatal acci- dents	total
I FALLS OF GROUNDS AND ROCKS		6.38	1.80	0.44	0.03	8.66	2.02	0.54	0.15	0.00	2.73	-	-	-	-	1.91	0.59	0.12	-	2.64	10.32	2.94	0.72	0.03	14.04				
II. TRANSPORT, TOTAL		2.35	0.87	0.25	0.02	3.51	0.81	0.21	0.07	-	1.11	0.01	0.00	-	0.02	7.56	2.46	0.78	0.04	10.85	10.76	3.56	1.11	0.06	15.51				
a) Continuous Transport		0.16	0.05	0.02	0.00	0.26	0.05	0.01	0.00	-	0.07	-	-	-	-	0.49	0.16	0.04	0.00	0.72	0.71	0.24	0.08	0.01	1.06				
b) Discontinuous Transport		2.19	0.81	0.22	0.01	3.25	0.76	0.19	0.06	-	1.03	0.01	0.00	-	0.02	7.06	2.29	0.73	0.03	10.12	10.04	3.31	1.02	0.05	14.44				
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL		2.43	0.63	0.15	-	3.23	1.99	0.51	0.09	-	2.60	-	-	-	-	15.89	4.70	0.97	0.00	21.58	20.33	5.85	1.22	0.00	27.42				
a) While moving about the mine		0.64	0.16	0.04	-	0.85	0.55	0.10	0.01	-	0.67	-	-	-	-	7.95	2.41	0.52	-	10.89	9.15	2.68	0.58	-	12.42				
b) In the course of other activities		1.79	0.46	0.11	-	2.37	1.44	0.40	0.07	-	1.93	-	-	-	-	7.94	2.29	0.44	0.00	10.69	11.17	3.17	0.64	0.00	15.00				
IV MACHINES, TOOLS AND SUPPORTS TOTAL		4.87	1.17	0.27	0.00	6.32	2.09	0.47	0.09	-	2.66	0.02	0.00	0.00	0.03	5.57	1.52	0.29	-	7.39	12.57	3.17	0.66	0.00	16.42				
a) Machines		0.90	0.20	0.05	0.00	1.17	0.18	0.07	0.01	-	0.27	0.00	-	-	0.00	0.41	0.08	0.02	-	0.53	1.51	0.37	0.09	0.00	1.98				
b) Tools		0.39	0.09	0.02	-	0.51	0.24	0.03	0.01	-	0.29	0.01	0.00	-	0.01	1.34	0.41	0.10	-	1.86	2.00	0.54	0.14	-	2.70				
c) Supports		3.57	0.87	0.18	-	4.63	1.65	0.36	0.06	-	2.09	0.00	-	0.00	0.01	3.81	1.01	0.15	-	4.99	9.05	2.25	0.42	-	11.73				
V FALLS OF OBJECTS		3.31	1.02	0.17	-	4.52	1.08	0.34	0.06	-	1.49	0.01	0.00	-	0.02	4.04	1.14	0.27	-	5.46	8.46	2.52	0.51	-	11.51				
VI EXPLOSIVES		0.07	0.00	0.00	-	0.08	0.01	0.00	-	-	0.01	-	-	-	-	0.06	0.02	0.00	-	0.09	0.15	0.03	0.00	-	0.20				
VII IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
VIII. OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO ₂ , CH ₄ , CO, H ₂ S), TOTAL		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
a) Outbursts of Gas		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
b) De-oxygenation and Poisoning by natural Gases		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
IX. HEATINGS OR FIRES		-	-	-	-	-	-	0.00	-	-	0.00	-	-	-	-	-	-	-	-	-	-	0.00	-	-	0.00				
X. INRUSHES		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
XI. ELECTRICITY		0.00	-	-	-	0.00	0.00	-	-	-	0.00	-	-	-	-	0.01	0.00	-	0.00	0.02	0.02	0.00	-	0.00	0.03				
XII. OTHER CAUSES		2.23	0.66	0.14	-	3.04	1.39	0.33	0.04	-	1.78	0.02	0.01	0.00	0.05	8.48	2.24	0.43	-	11.17	12.14	3.26	0.64	-	16.05				
TOTAL		21.68	6.20	1.45	0.05	29.40	9.43	2.44	0.54	0.00	12.43	0.09	0.03	0.00	0.14	43.57	12.70	2.89	0.05	59.24	74.79	21.38	4.91	0.12	101.22				

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miners' social insurance scheme.

(2) Accidents involving more than five casualties (i.e. who either died or were unable to resume work underground for at least eight weeks).

DETAILED BREAKDOWN OF VICTIMS ACCORDING TO LOCATION
AND NATURE OF INJURY AND PERIOD OF INCAPACITY

Table 2a

Common Statistics on victims
of accidents underground in coal mines

(absolute figures)

YEAR 1980

COUNTRY United Kingdom

MAN-HOURS WORKED (1) 300 085 500

NATURE OF THE INJURY	Amputations and enucleations			Fractures with or without dislocation			Luxations, twist and sprains			Concussion and internal injury			Open wounds, contusion and muscular abrasions			Burns and harmful effects of electricity and radiation			Poisoning and suffocation			Multiple injuries of those not specified (2)			TOTAL					
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
PERIOD OF INCAPACITY	> 56 days (2)	Fatal accidents	total	> 56 days (2)	Fatal accidents	total	> 56 days (2)	Fatal accidents	total	> 56 days (2)	Fatal accidents	total	> 56 days (2)	Fatal accidents	total	> 56 days (2)	Fatal accidents	total	> 56 days (2)	Fatal accidents	total	> 56 days (2)	Fatal accidents	total	4 to 20 days (2)	21 to 56 days (2)	> 56 days (2)	Fatal accidents	total	
LOCATION OF THE INJURY																														
I. Head and neck	0	1	1	10	6	47	3	0	137	0	0	0	43	1	1504	0	0	4				0	1	4	1374	258	56	9	1697	
II. Eyes	3	0	3							0	0	0	20	0	452	0	0	5				16	0	511	823	109	39	0	971	
III. Trunk	0	0	0	27	2	74	174	0	4785	0	0	0	64	1	1758	0	0	1				0	3	8	5091	1264	265	6	6626	
IV. Upper limbs (excluding the hands) (2)	0	0	2	44	1	153	27	0	577				39	0	1577	0	0	19				0	0	13	1737	493	110	1	2341	
V. Hands	25	0	83	52	0	469	11	0	191				238	0	6741	0	0	16				0	0	32	5282	1924	326	0	7532	
VI. Lower limbs (excluding feet) (2)	3	0	5	138	0	273	141	0	2954				146	0	3719	0	0	20				2	0	9	5174	1376	430	0	6980	
VII. Feet	2	0	5	36	0	168	2	0	164				60	0	1731	0	0	6				0	0	1	1472	503	100	0	2075	
VIII. Multiple locations	1	0	4	38	4	77	33	1	626	0	0	0	70	2	1280	1	0	18				1	2	9	1405	456	144	9	2014	
IX. Not specified																0	1	17	0	1	3	5	11	124	90	36	5	13	144	
TOTAL	34	1	103	345	13	1261	391	1	9434	0	0	0	680	4	18762	1	1	106	0	1	3	24	17	711	22448	6419	1475	38	30380	

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miner's social insurance scheme.

(2) The hips and the ankles are included under "Lower limbs".

A. Comparative table of the number of persons incapacitated by accidents for longer than 56 days

Frequency rates
Years 1958 to 1980

ITALY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1) Falls of ground	1,355	1,378	1,808	-	0,792	0,366	0,893	5,572	6,360	5,580	0,182	3,656	-	5,958	2,20	-	-	-					
2) Haulage and transport	1,335	0,984	1,205	0,676	1,847	1,465	1,787	-	0,707	0,797	0,812	-	-	3,404	-	-	-						
3) Movement of personnel	0,668	0,394	1,005	1,578	1,056	0,732	1,787	-	0,707	1,594	0,812	1,462	-	1,702	-	3,25	-						
4) Machinery, handling of tools and supports	1,169	0,984	0,603	0,902	1,584	1,465	3,127	7,164	7,067	13,552	7,304	8,043	6,896	2,553	-	-	-	4,00	Production stopped				
5) Falling objects	1,169	1,698	1,808	2,029	2,375	3,296	3,574	0,796	-	6,377	6,493	3,656	-	1,702	-	-	1,64	-					
6) Explosives	0,167	-	-	0,225	-	0,366	-	-	-	-	-	-	-	-	-	-	-	-					
7) Explosions of firedamp or coal dust	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
8) Sudden outburst of firedamp, suffocation by natural gases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
9) Underground combustion and fires	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
10) Inrushes of water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
11) Electricity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
12) Other causes	0,334	0,591	0,603	0,451	-	-	-	1,592	3,360	3,189	0,812	-	5,172	0,851	-	-	-	-					
TOTAL	6,197	6,299	7,032	5,861	7,654	7,690	11,168	15,124	18,201	31,089	17,043	16,817	12,068	16,170	2,20	3,25	1,64	4,00					

B. Comparative table of underground fatalities

Frequency rates

Years 1958 to 1980

ITALY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
1) Falls of ground	0,167	-	0,201	0,225	-	0,366	-	-	-	-	-	-	-	-	2,20	-	-	-					
2) Haulage and transport	-	0,197	-	-	-	-	-	-	-	0,797	-	-	-	-	-	-	-	-					
3) Movement of personnel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
4) Machinery, handling of tools and supports	-	-	-	-	-	-	-	-	-	0,797	-	-	-	-	-	-	-	-					
5) Falling objects	-	0,197	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
6) Explosives	0,501	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
7) Explosions of firedamp or coal dust	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
8) Sudden outbursts of firedamp, suffocation by natural gases	0,167	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
9) Underground combustion and fires	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
10) Inrushes of water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
11) Electricity	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
12) Other causes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
TOTAL	0,835	0,394	0,201	0,226	-	0,366	-	-	-	1,594	-	-	-	-	2,20	-	-	-					

Production stopped

A. Comparative table of the number of persons incapacitated by accidents for longer than 56 days
 Frequency rates
 Years 1958 to 1980

NETHERLANDS	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	
1) Falls of ground	1,326	1,464	1,305	1,829	2,238	1,742	2,017	1,923	1,688	2,466	2,450	2,737	2,634	2,528	2,06	4,219	1,041							
2) Haulage and transport	1,511	1,562	1,898	1,924	2,590	1,826	1,952	2,808	2,621	1,866	2,407	2,562	2,634	1,820	2,19	2,443	2,603							
3) Movement of personnel	0,324	0,386	0,187	0,514	0,580	0,630	0,472	0,774	0,605	0,766	1,160	1,165	0,905	0,404	1,03	0,888	0,521							
4) Machinery, handling of tools and supports	0,617	0,402	0,780	0,915	1,015	1,050	1,094	1,282	2,066	0,833	1,031	1,689	1,894	3,033	1,81	1,554	4,686							
5) Falling objects	0,401	0,515	0,492	0,819	0,642	0,630	0,923	0,862	0,958	0,866	1,590	1,106	0,659	1,213	1,55	0,888	1,562	Production stopped						
6) Explosives	-	-	-	-	-	-	0,021	-	-	-	-	-	-	-	-	-	-							
7) Explosions of firedamp or coal dust	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
9) Underground combustion and fires	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
10) Inrushes of water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
11) Electricity	-	-	-	-	0,021	-	0,021	-	-	-	-	-	-	-	-	-	-							
12) Other causes	0,262	0,161	0,390	0,210	0,497	0,147	0,129	0,088	0,353	0,700	0,301	0,116	0,165	0,202	0,52	0,666	-							
TOTAL	4,441	4,490	5,051	6,212	7,583	6,025	6,629	7,737	8,291	7,497	8,939	9,375	8,891	9,201	9,15	10,659	10,413							

B. Comparative table of underground fatalities
 Frequency rates
 Years 1958 to 1980

NETHERLANDS	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	
1) Falls of ground	0,262	0,064	0,034	0,114	0,062	0,084	0,043	0,044	0,050	0,100	0,173	0,058	0,082	0,101	-	-	-							
2) Haulage and transport	0,077	0,145	0,067	0,095	0,062	0,105	0,172	0,177	0,126	-	0,086	-	0,165	-	0,26	-	-							
3) Movement of personnel	-	-	-	-	-	-	-	-	-	-	-	0,038	-	-	-	-	-							
4) Machinery, handling of tools and supports	0,015	0,016	-	-	0,041	-	-	0,022	-	0,067	-	0,117	-	-	-	-	-							
5) Falling objects	-	0,016	-	-	-	-	0,043	-	-	-	0,043	-	-	-	-	-	0,521	Production stopped						
6) Explosives	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
7) Explosions of firedamp or coal dust	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
9) Underground combustion and fires	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
10) Inrushes of water	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
11) Electricity	-	-	-	0,019	-	-	-	-	-	-	-	-	-	-	-	-	-							
12) Other causes	-	-	0,017	-	-	-	-	-	-	-	-	-	-	-	-	-	-							
TOTAL	0,355	0,241	0,119	0,229	0,166	0,189	0,258	0,243	0,176	0,167	0,301	0,233	0,247	0,101	0,26	-	0,521							

SECTION IV

STATISTICAL TABLES FOR THE EXTRAC-
TIVE INDUSTRIES OTHER THAN THE COAL
INDUSTRY

FEDERAL REPUBLIC OF GERMANY

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

FEDERAL REPUBLIC OF GERMANY

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL	S O	42	87.145.911	t saleable	184.115
LIGNITE	O	36	129.878.527	t	19.539
OIL	D	143	4.631.343	t	7.398
NATURAL GAS AND GAS FROM OIL DEPOSITS	D	273	17.734.822	1.000 m ³	
IRON (ORE)	S	6	1.947.695	t	830
ALUMINIUM (ORE)	S	1	264	t	-
COPPER (ORE)	S) 2	1.274	t (Cu)) 1.010
LEAD (ORE)	S		23.067	t (Pb)	
ZINC (ORE)	S		99.720	t (Zn)	
POTASH SALTS	S	11	5.531.188	t (K ₂ O)	8.648
ROCK SALTS	S	8	7.564.862	t	1.766
MARBLE FOR POLISHING					
MARBLE FOR SEDIMEN- TARY					
MARBLE IGNEOUS					
SLATE	S + O	23	58.570	t	399
FOUNDRY AND OTHER INDUSTRIAL SANDS	O	5	11.777	t	14
ALLUVIAL SANDS AND GRAVEL	O			million t	
S : deep mining O : opencast mining or quarrying D : boreholes					

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

FEDERAL REPUBLIC OF GERMANY

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
HARD DIMENSION STONE	0			million t	
- BUILDING STONE					
- PAVING STONE					
- MONUMENTAL STONE					
HARD CRUSHED STONE					
- FOR CONCRETE					
- ROAD BASES					
- SURFACING					
LIME PRODUCTION AND CHALK	0			million t	
GYPNUM	0	40	1.625.366	t	1.564
STEATITE	0	4	12.265	t	49
KAOLIN	0	26	501.701	t	1.594
PEGMATITE	0	11	89.020	t	153
CALCSPAR	0	4	4.565	t	20
SANDSTONE	0	1	37 million	units	28
DOLOMITE	0	2	774.191	t	41
SULPHUR	D	3	813.732	t	188
PYRITE	S	4	502.390	t	742
GRAPHITE	S	1	11.375	t	189
FLUORSPAR	S	15	78.152	t	124
FELDSPAR	S	17	380.880	t	167
URANIUM	S	12	11.349	t	161
TALC	0	4	3.234	t	14
NATURAL STONE					
LIMESTONE	S	7	2.345.930		171
BARYTES	0/S	7	186.435		271

BELGIUM

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

BELGIUM

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL	S	6	6 324 034	T	20 383
	O	1	-		47
LIGNITE	O	1	443	T	4
OIL					
NATURAL GAS					
IRON					
ALUMINIUM					
COPPER					
LEAD					
ZINC					
POTASH SALTS					
ROCK SALTS					
MARBLE FOR POLISHING	S	1	(a)	111 ³	12
MARBLE (SEDIMENTARY)	O	3	186 604	m ² (20mm)	13
MARBLE (IGNEOUS)					
SHALE, SLATE	S + O	7	2 995	T	61
SHALE, FOUNDRY AND OTHER INDUSTRIAL SANDS	O	233	12 088 134	T	1 104
ALLUVIAL SANDS AND GRAVEL	O	65	5 244 356	T	938
			Total		22 562
S : deep mining O : opencast mining or quarrying D : boreholes					

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

BELGIUM

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
HARD DIMENSION STONE					
- BUILDING STONE					
- PAVING STONE					
- MONUMENTAL STONE					
TOTAL	0	75	95 488	T	271
HARD CRUSHED STONE {	0	77	28 912 461	T	2 067 (1)
- FOR CONCRETE			94 793 (1)		343 (1)
- ROAD BASES					
- SURFACING					
CHALK		2	226744	T	20
GYPSUM					
HARD STONE FOR CALCINATION					
FOR LIME KILNS	0	19	4 227 487	T	1255
FOR CEMENT	0	4	4 385 810	T	115
DOLOMITE	0	11	3 327 680	T	412
KAOLIN	0	5	39 685	T	6
CLAYS	0	108	4 100 000 (2)	T	4 199

(1) 1978 figures corrected

(2) Estimate

DENMARK

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

DENMARK

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL	S O				
LIGNITE	S O				
OIL	D	1	300 000	t	
NATURAL GAS	D				
IRON					
ALUMINIUM					
COPPER					
LEAD 1)	} S	1	648 000 t ore processed into 42 000 lead concentrate 151 000 zinc concentrate		300
ZINC 2)					
POTASH SALTS					
ROCK SALTS OR SEA SALT	S	2	347 423	t	
PEAT LITTER	O	22	275 332	m ³	
MARBLE FOR POLISHING					
MARBLE (SEDIMENTARY)					
MARBLE (IGNEOUS)					
SLATE	O	1	1 682	m ³	
SANDS					
FOUNDRY AND OTHER INDUSTRIAL SANDS	O + dredging	1002	25 701 543	m ³	
ALLUVIAL SANDS AND GRAVEL	O + dredging		2 782 865	m ³	
S : deep mining O : opencast mining or quarrying D : boreholes					

1) Pb 42 000 t concentrate (with silver content)

2) Zn 148 000 t

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

DENMARK

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
HARD DIMENSION STONE) - BUILDING STONE - PAVING STONE - MONUMENTAL STONE	0	5	71 414	m ³	
HARD CRUSHED STONE - FOR CONCRETE - ROAD BASES - SURFACING					
CHALK	0	23	2 793 429	m ³	
GYPSUM					
Other types of stones					
MOLER (FOR INSULATION)	0	10	179 685	m ³	
FIRECLAY	0	3	12 300	m ³	
CLAY FOR BRICKS AND ROOF TILES	0	114	1 066 822	m ³	
KAOLIN	0	1	9 000	m ³	

FRANCE

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

FRANCE

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL	S + O	25	18 135 000	T	48 412
LIGNITE	S + O	2	2 585 000	T	1 830
OIL	D	26	1 405 000	T	- - -
NATURAL GAS	D	5	80 200	10 ⁶ kwh	
IRON	S	21 *	28 981 000	Tm	3 976
ALUMINIUM	S + O	12	1 953 000	Tm	791
COPPER	--	--	---	--	---
LEAD	S	4	28 847	T/Pb	924
ZINC	S	3	36 810	T/Zn	
POTASH SALTS	S	3	1 891 000	T/k ₂ O	4 251
ROCK SALTS	S + D	1 + 12	6 379 000	T	1 995
GRAVESTONE MARBLE	-	-	30 000	m ³	---
MARBLE (SEDIMENTARY)					
MARBLE (IGNEOUS) ROOF SLATE	S	41	95 300	T	2 300
SLATES, FOUNDRY AND OTHER INDUSTRIAL SANDS	O	56	6 604 000	T	---
ALLUVIAL SANDS AND GRAVEL	O	2 033	215 280 000	T	14 509
S : deep mining O : opencast mining or quarrying D : boreholes				TM = tonne of ore	

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

FRANCE

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
HARD DIMENSION STONE	0	} ~ 2000			13 291
- BUILDING STONE	S + 0				
- PAVING STONE	0				
- MONUMENTAL STONE	S + 0				
HARD CRUSHED STONE					
- FOR CONCRETE		945	113700000	T	9 625
- ROAD BASES	0				
- SURFACING					
HARD STONE FOR CALCINATION	0		6603000		3 485
CHALK	S + 0	-	-	-	-
GYPNUM AND PLASTER	S + 0	21	6491000	T	4 235
URANIUM	S + 0	26	3 172	T/U	2 599
TUNGSTEN	S + 0	3	727	T/WO3	146
GOLD	-	1	1163	kg/Au	237
FLUORSPAR		11	256000	T/Ca F2	557
BARYTES		12	225000	T	180
TALC		1	316000	T	393

IRELAND

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

IRELAND

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL	S	8	45,676	saleable	297
	O	3	20,829	"	12
LIGNITE					
OIL	D	3	NIL		210
NATURAL GAS	D	2	32,2443	M.S.C.F.	32
IRON					
COPPER (ore)	S	2	511.130	R.O.M.	252
			10.059	CONC.	
COPPER (ore)	O	1	228.160	R.O.M.	6
			4.490	CONC.	
LEAD (ore)			2,807,922	R.O.M.	1.787
	S	3	102,839	Pb. Conc.	
ZINC (ore)			427,157	Zn. Conc.	
POTASH SALTS					
ROCK SALTS					
MARBLE FOR POLISHING	O	3	N.A.		15
MARBLE FOR SEDIMENTARY					
MARBLE IGNEOUS					
SANDS					
SLATE, FOUNDRY AND OTHER INDUSTRIAL SANDS					
ALLUVIAL SANDS AND GRAVEL	O	333	N.A.		900
S : deep mining O : opencast mining or quarrying D : boreholes					

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

IRELAND

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
HARD DIMENSION STONE					
- BUILDING STONE		7	N.A.		24
- PAVING STONE	0	14	N.A.		49
- MONUMENTAL STONE	0				
HARD CRUSHED STONE					
- FOR CONCRETE	0	62	N.A.		770
- ROAD BASES					
- SURFACING					
HARD STONE FOR CAL- CINATION					
- FOR LIME					
- FOR CEMENT KILNS	0	2	N.A.		38
CHALK					
GYPSUM					
	S	2	349,098	saleable	75
OTHER ROCKS :					
LIMESTONE					
	0	83	N.A.		1.461
SHALE					
	0	11	N.A.		30
BARYTES					
	S	1	13,880	conc.	31
	0	2	250,957	conc.	87
PYRITE					
	S + 0	*	27,021	Conc.	*
CLAY					
	0	6	N.A.	-	15

* Byproduct of copper ores referred to previously.

ITALY

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

ITALY

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS	
COAL	S	0	-	net t	213	
LIGNITE	S	2	1 932 571		655	
OIL	D		1 800 130			
NATURAL GAS			12 531 480			
IRON (ores)	S + O		184 733	t 40% Fe	308	
ALUMINIUM (ores)	O	2	291 199	t	4 000	
COPPER (ore)	S	3	2 286		181	
LEAD			} 214 520		2 282	
ZINC						
POTASH SALTS	S	5	1 301 649	1 K ₂ O(12%)	1 333	
ROCK SALT (except sea salt)	S	7	} 3 997 096		}	283
	O	4				
MARBLE FOR POLISHING						
MARBLE SEDIMENTARY						
MARBLE IGNEOUS						
Total MARBLE		100	896 000		1 256	
SLATE		129	1 021 000		379	
SANDS (FOUNDRY AND OTHER INDUSTRIAL SANDS)		99	4 189 000		495	
ALLUVIAL SANDS AND GRAVEL		2 270	127 140		7 515	

S : deep mining O : opencast mining or quarrying D : boreholes

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

ITALY

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
HARD DIMENSION STONE					
- BUILDING STONE		3 532			
- PAVING STONE					
- MONUMENTAL STONE		2 473	13 036 000		15 025
HARD CRUSHED STONE					
- FOR CONCRETE					
- ROAD BASES AND SURFACING					
HARD STONE FOR CALCINING					
- FOR LIME FURNACES			57 167 000		
- FOR CEMENT					
CHALK		100	4 820 000		564
GYPSUM					
CLAY		1 036	35 442 000		2 664
DOLOMITE		31	1 176 000		109
AGGREGATE			65 520 000		
PYRITE	S	5	858 992	37.8% S	857
MANGANESE	S	1	9 165	29% Mn	12
SULPHUR	S		9 287	12% S	611
ANHYDRITE	O		2 420		141
ASBESTOS	O	2	157 794		301

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

ITALY

MINERAL	MINE, QUARRY OR BORE HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
BARITE	S	14	203 038		379
FELDSPAR	S	7	344 301		104
FLUORSPAR	S/O	11	151 965	85%CaF ₂	709
GRAPHITE	S	1	3 957		19
MARL	O	27	12 044 195		285
ASPHALTIC ROCK FOR SURFACING	O	3	} 117 893		41
BITUMINOUS ROCK	O	1			
HYDRATED ALUMINIUM SILICATES	S/O	40	646 802		229
TALC AND STEATITE	S	16	165 905		432
MERCURY	S		3 303		
ANTIMONY	O		676		38
CELESTITE	O	1	1 053	50.2%SS	1
STEAM	O	12	29 666 176		335

LUXEMBURG

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

LUXEMBOURG

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS FROM ORE OF MINERAL	PERSONS
COAL					
LIGNITE					
OIL					
NATURAL GAS					
IRON (silicious)	S	1	560 165	t	180
ALUMINIUM	O	1			
COPPER					
LEAD					
ZINC					
POTASH SALTS					
ROCK SALTS					
MARBLE FOR POLISHING					
MARBLE (SEDIMENTARY)					
MARBLE (IGNEOUS)					
SANDS					
SLATE, FOUNDRY AND OTHER INDUSTRIAL SANDS					
ALLUVIAL SANDS AND GRAVEL					
S : deep mining O : opencast mining or quarring D : boreholes					

(1) Combined

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

LUXEMBOURG

MINERAL	MINE, QUARRY OR BORE HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS	
HARD DIMENSION STONE	O O O	}	- BUILDING STONE	14 593	T	
- PAVING STONE			-			
- MONUMENTAL STONE			282.2	m^3		
- SIZED STONE			589.7	m^2		
- FACING STONE			4 238	m^2		
HARD CRUSHED STONE						
- FOR CONCRETE						
- ROAD BASES						
- SURFACING						
CHALK				32	1 060 015	
GYPSUM						
SAND			709 746	T		
GRAVEL			215 916	T		
SLATE	S	1	1 212	1000p		
POLISHED MONUMENTAL STONE			2 303	m^2	49	
MONUMENTAL STONE			297	T		
PLASTER	S	1	856	T	15	

NETHERLANDS

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980 *

NETHERLANDS

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL					
LIGNITE					
OIL	D	1	1.403.000	t	± 2.400
NATURAL GAS	D	6	95.000 x 10 ⁶	m ³	
IRON					
ALUMINIUM					
COPPER					
LEAD					
ZINC					
POTASH SALTS	D	1	6.500	tK ₂ O	10
ROCK SALTS	D	1	2.940.000	t	55
MARBLE FOR POLISHING					
MARBLE FOR SEDIMEN- TARY					
MARBLE IGNEOUS					
SANDS SLATE, FOUNDRY AND OTHER INDUSTRIAL SANDS					
ALLUVIAL SANDS AND GRAVEL	O		34.450.000	t	
S : deep mining O : opencast mining or quarrying D : boreholes					

* Approximate figures

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980 *

NETHERLANDS

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
HARD DIMENSION STONE - BUILDING STONE - PAVING STONE - MONUMENTAL STONE					
HARD CRUSHED STONE - FOR CONCRETE - ROAD BASES - SURFACING					
CHALK					
GYPSUM					
MARL	0	3	2.993.000	t	80
SANDSTONE	0	1	196.000	t	4

* Approximate figures

UNITED KINGDOM

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

UNITED KINGDOM

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION (MILLION TONNES)	TONS ROM ORE OF MINERAL	PERSONS
COAL					
LIGNITE					
OIL					
NATURAL GAS					
IRON					
ALUMINIUM					
COPPER (ore)	S		0.2	} thousand tonnes	} 1,267 (includes silver)
LEAD (ore)	S		3.6		
ZINC (ore)	S		4.4		
TIN	S		3.3		
WOLFRAM	S				
POTASH SALTS					
ROCK SALTS					
MARBLE FOR POLISHING					
MARBLE FOR SEDIMENTARY					
MARBLE IGNEOUS					
SANDS					
SLATE, FOUNDRY AND	0	(SLATE)	0.2		654
OTHER INDUSTRIAL SANDS	0	(INDUSTRIAL)	5.7		1,301
ALLUVIAL SANDS AND GRAVEL	0		96 (including 12.5 million tonnes marine dredged material)		9,242
S : deep mining O : opencast mining or quarrying D : boreholes					

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1980

UNITED KINGDOM

MINERAL	MINE, QUARRY OR BORE- HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION (MILLION TONNES)	TONS ROM ORE OF MINERAL	PERSONS
HARD DIMENSION STONE					
- BUILDING STONE					
- PAVING STONE					
- MONUMENTAL STONE					
HARD CRUSHED STONE					
- FOR CONCRETE					
- ROAD BASES					
- SURFACING					
CHALK					
GYPSUM & ANHYDRITE	S + 0		3.45		615
LINESTONE	S + 0		72.4		10,169
CLAY SHALE	0		19.8		1,413
CHALK & CHERT	0		13.7		1,134
IGNEOUS ROCK	0		28.5		5,248
SANDSTONE	0		9.8		2,056
CLAY (China & Ball Clay)	S + 0		3.96		3,567
CALCSPARE	S + 0		0.018		39

ANNEXES

**TERMS OF REFERENCE AND RULES OF PROCEDURE
OF THE MINES SAFETY COMMISSION**

*Decisions from the Council of Ministers of
9 July 1957, 11 March 1965 and 27 June 1974*

COUNCIL OF MINISTERS

DECISION

of 9 July 1957

concerning the terms of reference and rules
of procedure of the Mines Safety Commission

Having taken note of the Recommendations adopted by the Conference on Safety in Coalmines and of the proposals submitted by the High Authority in connection with the Conference's final Report, which afford a working basis for the improvement of safety in coalmines, and

having regard to their Decisions at the Council's 36th and 42nd sessions on September 6, 1956 and on May 9 and 10, 1957, setting up the Mines Safety Commission,

THE REPRESENTATIVES OF THE GOVERNMENTS OF THE MEMBER STATES MEETING
AT THE SPECIAL COUNCIL OF MINISTERS,

- hereby lay down that the terms of reference of the aforesaid Commission shall be as follows:

1. The Commission shall follow developments regarding safety in coalmines, including those regarding the safety regulations instituted by the public authorities, and assemble the necessary information concerning progress and practical results obtained, more especially in the matter of accident prevention.

To secure the necessary information, the Commission shall apply to the Governments concerned.

The Commission shall evaluate the information in its possession and submit to the Governments proposals for the improvement of safety in coalmines.

2. The Commission shall help the High Authority to work out a method of compiling intercomparable accident statistics.
3. The Commission shall ensure the prompt forwarding to the quarters directly concerned (including in particular mines inspectorates and employers' and workers' associations) of relevant information assembled by it.
4. The Commission shall ascertain, by regular contact with the Governments, what action is being taken to implement the proposals of the Conference on Safety in Coalmines, and such proposals as it may itself draw up.
5. The Commission shall propose such study and research as it deems most indicated for the improvement of safety, with notes as to the way in which these can best be effected.
6. The Commission shall facilitate the exchange of information and experience among persons responsible for safety matters, and propose appropriate measures for this purpose (e.g. organization of study sessions, establishment of documentation services).
7. The Commission shall propose appropriate measures for ensuring the necessary liaison among the rescue services of the Community countries.

8. The Commission shall submit annually to the Council of Ministers and the High Authority a Report on its activities and on developments regarding safety in coalmines in the different member States. In this connection, it shall in particular examine the statistics compiled on accidents and incidents in coalmines.

- The Representatives of the Governments further lay down that the rules of procedure of the Commission shall be those set forth in the Annex to the present Decision.
- The Representatives of the Governments trust that the High Authority will arrange for the Commission to start work at the earliest possible moment.

This Decision was adopted by the Council at its forty-fourth session, on July 9, 1957.

For the Council,

J. REY

President.

RULES OF PROCEDURE
of the Mines Safety Commission

CHAIRMAN

Article 1

The Chairman of the Mines Safety Commission shall be a Member of the High Authority of the European Coal and Steel Community.

Article 2

The Chairman shall conduct the work of the Commission in accordance with these Rules of Procedure.

MEMBERS

Article 3 (1)

The Commission shall consist of 36 members appointed by the Governments; each country shall have four members, of whom two shall be representatives of that country's Governments, one of the employers and one of the workers.

Each Government shall send in writing to the Chairman a nominal roll of the members appointed by it. It shall notify the Chairman of all changes in this.

Each Government may appoint for any particular meeting of the Commission one or two advisers, whose names it shall send to the Chairman.

I.L.O. PARTICIPATION

Article 4

Representatives of the International Labour Organization shall be invited to attend the proceedings of the Commission in a consultative capacity.

ORGANIZATION

(a) Restricted Committee

Article 5

A Restricted Committee shall be set up, to consist of Governments representatives on the Commission.

Article 6

The Chairman of the Commission shall act as Chairman of the Restricted Committee.

Article 7

The function of the Restricted Committee shall be to ensure permanent liaison among the Governments of the member States and between them and the Commission, more especially for the purpose of exchanging relevant information. The Restricted Committee shall see to the preparation of the Commission's activities.

Article 8 (1)

The Restricted Committee shall be convened by the Chairman.

The Chairman shall be required to convene it when asked to do so by the representatives of five or more Governments.

(b) Working Parties

Article 9

The Commission of the Restricted Committee may set up Working Parties of experts to consider specific technical matters.

Article 10

The Working Parties shall decide their own *modus operandi*.

Article 11

The Restricted Committee shall be given reports by the Working Parties on the results of their proceedings, which it shall submit to the Commission with the comments of its members.

In the event of differences of opinion within the Working Parties, the views expressed shall be given, together with the names of those expressing them.

SECRETARIAT

Article 12 (1)

The High Authority shall be responsible for the secretarial arrangements in connection with the work of the Commission, the Restricted Committee and the Working Parties.

These arrangements shall be under the charge of a High Authority staff member appointed to act as Secretary.

All documents shall be in the six official languages of the Community.

WORKING PROCEDURE

Article 13

The Chairman shall fix the agenda and the dates of meetings after consultation with the members of the Restricted Committee.

Article 14 (1)

The Chairman shall allow to speak any member of the Commission or representative of the International Labour Organization asking to do so.

The Chairman may allow advisers to speak.

Article 15

The members of the High Authority shall have the right to attend meetings of the Commission and of the Restricted Committee, and to speak there.

The Chairman may bring with him advisers, whom he may allow to speak.

Article 16

Where the Commission or the Restricted Committee deems it desirable to obtain information concerning the various aspects of safety in coalmines, it shall request this from the Governments of the member States.

Article 17 (1)

24 members shall constitute a quorum. Conclusions shall be adopted by majority of the members present.

Proposals by the Commission under 1,3 of its terms of reference shall, however, require a vote in favour by two-thirds of the members present, and by not less than nineteen members in all.

Any dissenting opinions shall be brought to the attention of the Governments should the members expressing them so request.

(1) Amended having regard to decision of the Council of the European Communities of 1 January 1973 (Official Journal of the European Communities L2 of 1 January 1973).

THE COUNCIL

DECISION (1)

of March 11, 1965

of the Representatives of the Governments
of the Member States assembled in the Special
Council of Ministers to modify the decision
of July 9, 1957

concerning the terms of reference and rules
of procedure of the Mines Safety Commission

THE REPRESENTATIVES OF THE GOVERNMENTS OF THE MEMBER STATES ASSEMBLED
IN THE SPECIAL COUNCIL OF MINISTERS -

having regard to the decision of July 9, 1957 regarding the terms of
reference and rules of procedure of the Mines Safety Commission, and

having regard to the High Authority's proposal of January 7, 1964,
and

seeing that this decision in no way affects Article 118 of the Treaty
setting up the European Economic Community,

DECIDE:

Article 1

The terms of reference of the Mines Safety Commission laid down by the decision
of July 9, 1957 are replaced by the provisions in the annex.

Article 2

The provisions of Article 17 of the rules of procedure annexed to the Decision
of July 9, 1957 are replaced by the following provisions:

"Should the Mines Safety Commission or the Restricted Committee consider it
desirable to receive information regarding the various fields for which it is
responsible, it shall apply to the Governments of the member States."

This decision was adopted by the Council at its one-hundredth session, on
March 11, 1965.

For the Council

M. MAURICE-BOKANOWSKI

President

(1) See "Journal officiel de la Communauté européenne du charbon et de l'acier" no. 46
of 22nd March 1965.

ANNEX

TERMS OF REFERENCE FOR THE MINES SAFETY COMMISSION

1. The Commission shall follow developments regarding safety and measures to avoid at working-points conditions which represent a danger to health in coalmines, including to this end the safety regulations instituted by the public authorities and assemble the necessary information concerning progress and practical results obtained.

To secure the necessary information, the Commission shall apply to the Governments concerned.

The Commission shall evaluate the information in its possession and submit to the Governments proposals for the improvement of safety and health conditions in coalmines.

2. The Commission shall help the High Authority to work out a method of compiling inter-comparable statistics on accidents and damage to health attributable to vocational activities in coalmines.
3. The Commission shall ensure the prompt forwarding to the quarters directly concerned (including in particular mines inspectorates and employers' and workers' associations) of relevant information assembled by it.
4. The Commission shall ascertain, by regular contact with the Governments, what action is being taken to implement the proposals of the Conference on Safety in Coalmines, and such proposals as it may itself draw up.
5. The Commission shall propose such study and research as it deems most indicated for the improvement of safety, and of healthy working conditions in coalmines, with notes as to the way in which these can be effected.
6. The Commission shall facilitate the exchange of information and experience among persons responsible for safety matters and the maintenance of healthy working conditions, and propose appropriate measures for this purpose (e.g. organization of study sessions, establishment of documentation services).
7. The Commission shall propose appropriate measures for ensuring the necessary liaison among the rescue services of the Community countries.
8. The Commission shall submit annually to the Council of Ministers and the High Authority a Report on its activities and on developments regarding safety and protection of health in coalmines in the different member States. In this connection, it shall in particular examine the statistics compiled in these fields.

COUNCIL DECISION

of 27 June 1974

on the extension of the responsibilities of the Mines Safety and Health Commission to all mineral-extracting industries

(74/326/EEC)

THE COUNCIL OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Economic Community, and in particular Article 145 thereof;

Having regard to the draft of the Commission;

Having regard to the Opinion of the European Parliament⁽¹⁾;

Having regard to the Opinion of the Economic and Social Committee;

Whereas the representatives of the Governments of the Member States meeting within the special Council of Ministers, by Decision of 9 and 10 May 1957, set up a Mines Safety and Health Commission whose terms of reference as laid down by Decision of 9 July 1957⁽²⁾ of the representatives of the Governments of the Member States meeting within the Special Council of Ministers, amended by Decision of 11 March 1965⁽³⁾ are to follow developments in safety and in the prevention of occupational risks to health in coal mines and to draw up proposals appropriate for the improvement of safety and health in coal mines;

Whereas this body has proved to be an effective and suitable instrument for safeguarding the health and safety of workers in coal mines;

Whereas problems of safety similar to those in coal mines also exist in other mineral-extracting industries;

Whereas the prevention of occupational accidents and diseases, as well as occupational hygiene, are among the objectives of the Treaty establishing the European Economic Community;

Whereas the Council resolution of 21 January 1974⁽⁴⁾ concerning a social action programme envisages an action programme for workers which aims *inter alia* at improvement in safety and health conditions at work;

Whereas the Safety and Health Commission should be assigned the task of extending to all mineral-extracting industries the preventive action which has hitherto been confined to coal mines;

Whereas the representatives of the Governments of the Member States meeting within the Council agreed to assign this task to the Safety and Health Commission,

HAS DECIDED AS FOLLOWS:

Article 1

1. Preventive action against risks of accident and occupational risks to the safety and health of workers in all mineral-extracting industries except simple excavation, excluding the protection of the health of workers against the dangers arising from ionizing radiations which is subject to special regulations pursuant to the Treaty establishing the European Atomic Energy Community shall be the responsibility of the Mines Safety and Health Commission within the terms of reference laid down by Decision of 11 March 1965 of the representatives of the Governments of the Member States meeting within the special Council of Ministers.

2. Mineral-extracting industries shall be taken to mean the activities of prospecting and of extraction in the strict sense of the word as well as of preparation of extracted materials for sale (crushing, screening, washing), but not the processing of such extracted materials.

3. Simple excavation shall be taken to mean work whose purpose is not the extraction of materials for use.

⁽¹⁾ OJ No C 40, 8. 4. 1974, p. 64.

⁽²⁾ OJ No 28, 31. 8. 1957, p. 487/57.

⁽³⁾ OJ No 46, 22. 3. 1965, p. 698/65.

⁽⁴⁾ OJ No C 13, 12. 2. 1974, p. 1.

Article 2

1. This Decision shall enter into force on the fifth day following its publication in the *Official Journal of the European Communities*.

2. It shall apply :

— to the underground activities of the mineral-extracting industries : as from the day laid down in paragraph 1 ;

— to the other activities of the mineral-extracting industries : as from 1 January 1976.

Done at Luxembourg, 27 June 1974.

For the Council

The President

K. GSCHIEDLE

**TERMS OF REFERENCE OF THE VARIOUS WORKING PARTIES
OF THE SAFETY AND HEALTH COMMISSION
FOR THE MINING AND OTHER EXTRACTIVE
INDUSTRIES**

TERMS OF REFERENCE COMMON TO ALL WORKING PARTIES

The Safety and Health Commission for the Mining and Other Extractive Industries recalls that from its inception, the exchange of experience and information in Working Parties has been completed wherever necessary in the mining basins, testing institutes and at the manufacturers.

A) General terms of reference

The Working Party on Ventilation and Mine Gas will examine general problems of ventilation, particularly where prevention of firedamp explosions is concerned and other means or measures should be applied in order to suppress or control firedamp.

In addition to the study of firedamp explosions occurring in the Community, attention will also be devoted to usable results of research in the field of firedamp outbursts, in particular where maximum permissible levels in ventilation air of firedamp and other poisonous gases are concerned, and the advance estimation of firedamp emission before a working is started.

Attention will also be devoted to appropriate speeds for the flow of ventilation air, measures to be taken in the event of deceleration of the flow of air, measures for the stabilization of ventilation and the means and procedures for monitoring ventilation.

B) Special terms of reference

1. Examination of the special requirements for workings with auxiliary ventilation in which dust control and air conditioning equipment is used
2. Examination of controlled partial recirculation of air in drivages.
3. Presentation of proposals for the selection of combinations of suitable materials for the impellers and housings of auxiliary fans.

4. Preparation of a report on "Methane under armoured conveyors".
5. Preparation of a second report on "Ignitions of fire-damp by power loaders and heading machines" including proposals to the Governments on automatic methane monitoring, ventilation of the space between the road-face and the body of the machine, horizon control and automatic extinguishing of ignitions.
6. Preparation of a report on "Heavy gas emissions".
7. Preparation of a report on "Effects of firedamp on the risk of explosion with coal dusts (in collaboration with the Working Party on "Flammable Dusts")".
8. Drafting of uniform requirements and specifications for the design and use of CH₄ monitoring instruments.
9. Preparation of a report on "Use of diesel engines underground in mines".
10. Drafting conclusions concerning outbursts of coal and gases.

**WINDING ROPES AND SHAFT GUIDES,
WINDING ENGINES AND WINCHES**

Terms of reference

1. Follow-up of progress made in the testing of winding ropes by means of appropriate instruments in order to obtain information concerning its application in the mines of the Community and the United Kingdom.
2. Testing of couplings for circular and flattened winding ropes.
3. Arrangements for the installation and inspection of capels.
4. Testing of guides for winding cages in drafts and guide mechanisms for cable haulage in roadways.
5. Maintenance required to ensure safe operation of winding ropes and balance ropes.
6. Use of studies on the dynamic behaviour of shaft and roadway ropes.
7. Exchange of views on the properties operating conditions and strength of winding ropes of particular interest.
8. Discussion on accidents involving winding and hauling ropes and their couplings, which could provide new information.

The Working Party is instructed to examine, by exchanging experience and by evaluating the results of research, whether it is possible to draw up measures or practical directives for the prevention of falls of ground, taking into account the individual features of coal measures and workings.

1. In particular : In the interest of better roof control, particularly within the context of working schedules, it will study :
 - 1.1. general measures to be taken into consideration in avoiding falls of ground, in the light of the type of measures and conditions of workings, e.g. sequence of working the seams, features of the working areas (length, speed of advance, etc.), type and characteristics of support ;
 - 1.2. specific measures to deal with individual difficulties which may or may not foreseeably arise in the long term, such as disturbance zones, protective banks, working of a face at right-angles to the end of an old seam, etc.
 - 1.3. specific measures to be taken when starting off a face in order to prevent abrupt subsidence of the roof.
2. It will also compare mining regulations on support and draw up minimum roof control requirements, taking into account the characteristics of the various faces (overall seam thickness, dip, dead rock ...).
3. Stability of Tips.

Terms of reference

1. Comparing adopted safety and accident prevention provisions relating to :
 - a) electric shock,
 - b) fire hazard,
 - c) explosion hazard.
2. Follow the evolution in Community countries with regard to safety regulations on underground electrical networks of low and medium voltage (up to 1 100 V) and feeder cables for movable equipment, with due regard to the specifications for the said cables.
3. Finish the report on steps to be taken when work has to be carried out on electrical equipment under voltage.
4. Finish the study on the construction of high-tension cables (of up to 6 000 V) used underground, and protective equipment.
5. Follow the evolution of oil-powered contactors used in gassy environments.
6. Follow the development of techniques designed to eliminate entirely the production of sparks on electrical contact lines (battery motors excluded).
7. Examination of the intrinsically safe circuits for remote control in conjunction with mechanisation automation.
8. The Mines Safety and Health Commission instructs the Working Party on Electricity :

- 8.1. to continue to take due note of the results of the work of the CENELEC entrusted with harmonizing the rules covering the design of electrical equipment for use in explosive atmosphere ;
- 8.2. to propose, if appropriate, modifications to the above documents of CENELEC to make them applicable to coal mines in countries of the European Community ;
- 8.3. to prepare the models of the certificates of conformity and control for Group I electrical apparatus (in collaboration with D.G. III of the EC - Commission) ;
- 8.4. to compare the rules covering installation and use of underground electrical equipment now current in each of the Community countries, particularly in respect of the dangers of firedamp ignition ; to ensure that the rules are uniform or to examine the equivalence of certain rules, so that such equipment can be used without modification in all the Community countries.

Terms of reference

1. To study and work out proposals on the aspects by which behaviour and attitudes of individuals in extractive industries can be influenced in order to improve safety and health and working conditions in these industries.
2. To gather, consider and disseminate information about behavioural, organisational and human factors relating to safety and health in extractive industries.
3. To consider arrangements for safety training.
4. To consider the initiation of campaigns designed beneficially to influence attitudes to safety at work.
5. To study the attitudes of work people and organisational arrangements in order to create greater involvement and awareness of safety and health.
6. To consider any other matters thought by the working party to be relevant to improving attitudes towards safety and health at work in extractive industries.

M E C H A N I Z A T I O N

Taking into consideration current techniques in winning and roadway driving linings and roadway conveyors, the working party is instructed to study particular ways of preventing accidents connected with mechanization.

In particular, it is to :

- a) compile a schedule for machinery manufacturers and users of the minimum work safety requirements for mechanical protection of machines and equipment;
- b) study safety provisions such as : visual and acoustic signalling, operating controls and in particular the ability to stop machines from any point on the face or roadway, taking account of modern means of telecommunication and remote control, electrical protection of motors in the event of overloading or jamming of equipment, lighting, etc.

K OIL, GAS AND OTHER MATERIALS EXTRACTED BY BOREHOLE

Terms of reference

1. In the light of information available on safety and health hazards and the causes of accidents during prospecting, boring and extracting to obtain petroleum, gas and other materials by the Community countries within their territory or offshore dependencies, the working party is instructed in particular :
 - a) to evaluate lessons to be drawn from several serious accidents which occurred during the evacuation of platforms off shore : recommendation on exercises for the rescue of men falling over board, for the evacuation of platforms, fire fighting, etc...
 - b) to form a study and editorial group which will study the problem of accident statistics in the specific field outlined under 1. in collaboration with the working party on Common Accident Statistics ;
 - c) to make proposals in the field of initial and refresher training for personnel of all ranks ;
 - d) to maintain contacts with the organizations and conferences working in this field, in particular with the "London Conference of Safety and Pollution Safeguards in the Development of North West European Offshore Mineral Resources" and particularly with its group III, with the "Inter-Governmental Maritime Consultative Organization", with the "International Labour Office" and the "European Diving Technology Committee".
 - e) to follow the evolution of techniques of exploiting by borehole, petroleum, gas and other materials; to up-date and develop proposals of the Safety and Health Commission for the mining and other extractive industries on the prevention of blowouts, and to propose useful methods of controlling these in the event of a blowout occurring.

Terms of reference

Taking into account the mechanism of dust combustion and of flame propagation and the various factors which may influence this, including the fact that methane is frequently involved in this phenomenon, the working party is instructed to carry out a study of precautions against dust explosions, in particular :

- a) dust neutralization (dust control in situ, stone dusting, spraying, dust fixation by means of spreading salts and coagulating pastes etc.), this study to include the comparative analysis of the regulations and instructions applied in the Community countries, along with the methods of application of the different processes,
- b) dust barriers of various types to halt dust explosions, mixed dust-methane explosions and pure methane explosions.

The working party may make any suggestions for research work considered necessary to advance the knowledge of the phenomena studied and to promote safety in these fields.

Studying, from the standpoint of technical prevention and industrial medicine, the prevention of environmental risks to the health of workers in coal mines, and other extractive industries.

1. To update the general directives concerning airborne dust control methods in coal mines during the use of power loaders and heading machines, particularly in connection with powered supports, underground crushers and rubber tyred transport vehicles.
2. Dust measurement (methods, frequency, measuring points, conclusions to be drawn etc.) and where necessary establishing a scale of comparison of the various methods employed in coal and other mines.
3. Establishment of airborne dust thresholds. Definition of categories of permissible dustiness. Steps to be taken when faced with various categories of dustiness, especially in coal mines.
4. Among the medical problems in the control of ambient health hazards to workers in mines and other extractive industries priority must be given to the study of the following factors : climate, noise, vibration, visibility and gas, in particular radon and H_2S , and other materials which might be dangerous to health.
5. To indicate the lines of research into the use of dangerous substances and to use their results to suggest appropriate action.

RESCUE ARRANGEMENTS,
FIRES AND UNDERGROUND COMBUSTION

A) General terms of reference

(Art. 7 of the Terms of Reference of the Mines
Safety and Health Commission)

Exchange of experience between the Community countries
on :

1. Rescue operations and action against spontaneous combustion, heatings and fires on the occasion of accidents or other events underground requiring the assistance of rescue teams, from which useful lessons have been learned ;
2. Organization of rescue operations underground and the presentation of reports every two years ;
3. The prevention of spontaneous combustion, heatings and fire outbreaks underground, the fighting and control of spontaneous combustion, heatings and fires, and reopening sealed-off workings.

B) Special terms of reference

1. Comparison of practical arrangements of rescue operations existing in the Community countries and possibly the drafting of a standard plan of procedure for the Community as a whole.
2. Exchange of experience and practical knowledge in the following fields :
 - a) methods and apparatus for the early detection of combustion, heatings and pit fires,
 - b) CO self-rescuers employing filters or oxygen and more

generally methods to protect personnel in noxious atmospheres (gas, fumes, oxygen deficiency etc.)

- c) Oxygen deficiency warning devices,
 - d) Fires in long plant,
 - e) Sealing off abandoned workings,
 - f) Specifications and testing conditions for fire-resistant fluids for mechanical power transmission.
3. Condensed comparative survey of new regulations and guidelines promulgated by the mining authorities of member countries on rescue arrangements, first aid and fire lighting and prevention.
- C) Analysis of results (partial or overall) of research projects at present in progress so as to :
- 1. Improve borehole rescue techniques,
 - 2. Define the standards to which flameproof clothing should conform.
- D) Studies to be completed on the following subjects :
- 1. Effects of a fire in shafts,
 - 2. Resources to be applied to combat the danger of explosion during firefighting : nitrogen and others.

Terms of reference

1. To extend the tables of accident statistics under ground, prepared for coal mines to all the extractive industries.

The working party shall determine the conditions for this extension and examine how the condensed statistics on socioeconomic items might be presented for all the extractive industries.

2. To establish statistics on certain occupational diseases notably, pneumoconiosis and deafness.
3. To study the possibility of introducing into the table for the coal mining industry which figures in the First Chapter of the Annual Report, other technical elements which may have an effect on the frequency of accidents.
4. In order to enable the Mines Safety and Health Commission to draw conclusions on accident prevention, the frequency of underground accidents in the Community coal mines should be examined, with the following objectives :
 1. To decide on suitable mathematical statistical systems;
 2. To evaluate, with their aid, chronological differences in frequency together with differences from country to country or coalfield to coalfield.

COMPOSITION OF THE SAFETY AND HEALTH COMMISSION FOR THE
MINING AND OTHER EXTRACTIVE INDUSTRIES
AND OF ITS WORKING PARTIES

**COMPOSITION OF THE SAFETY AND HEALTH COMMISSION FOR THE
MINING AND OTHER EXTRACTIVE INDUSTRIES AND OF ITS WORKING PARTIES**

A. SAFETY AND HEALTH COMMISSION

B. RESTRICTED COMMITTEE

- Secretariat P. LEMOINE

- WORKING PARTIES :

C. Ventilation, firedamp and other mine gases W. OBST

Committee of Experts :

C1. Firedamp monitoring instruments W. OBST

D. Winding ropes and shaft guides, winding engines
and winches H.J. WETEKAM

Committee of experts :

D1. Winding ropes H.J. WETEKAM

D2. Winding engines H.J. WETEKAM

E. Strata control and stability of ground P.A. WALKER

Committee of experts :

E1. Stability of tips P.A. WALKER

F. Electricity W. OBST

G. Human factors affecting safety W. OBST

Committee of experts :

G1. Community safety campaigns W. OBST

I. Mechanization H.J. WETEKAM

K. Oil, gas and other materials extracted by borehole. P.A. WALKER

Committees of experts :

K1. Prevention of blowouts P.A. WALKER

K2. Man overboard emergencies P.A. WALKER

K3. Oil and gas accident statistics P.A. WALKER

L. Flammable dusts H.J. WETEKAM

M. Health in mines P. LEMOINE

Committees of experts :

M1. Respirable dusts P. LEMOINE

M2. Noise P. LEMOINE

N.	Rescue arrangements, mine fires and underground combustion	P.A. WALKER
	Committees of experts :	
N1.	Stabilization of ventilation	P.A. WALKER
N2.	Fire-resistant fluids	P.A. WALKER
N3.	Conveyor belts and other long items of plant ...	P.A. WALKER
N4.	Self-rescuers	P.A. WALKER
N5.	Safety signs	P.A. WALKER
O.	Common accident statistics	P.A. WALKER

ORGANE PERMANENT
SAFETY AND HEALTH COMMISSION
STAENDIGER AUSSCHUSS
ORGANO PERMANENTE
PERMANENT ORGAAN
DET STAENDE UDVALG

Président/Chairman/Vorsitzender
Presidente/Voorzitter/Formand

Ivor RICHARD

ORGANE PERMANENT
Bâtiment Jean Monnet
Plateau du Kirchberg
L - 2920 LUXEMBOURG
Tel. 43011-2786

Secrétaire/Secretary/Sekretär
Segretario/Secretaris/Sekretaer

Pierre LEMOINE

Représentants du Gouvernement
Government Representatives
Regierungsvertreter
Rappresentanti Governativi
Regeringsvertegenwoordigers
Regeringsrepraesentent

Représentants des Employeurs
Employer's Representatives
Vertreter der Arbeitgeber
Rappresentanti dei datori di lavoro
Vertegenwoordigers v.d. werkgevers
Repraesentent for arbejdsgeberne

Représentants des Travailleurs
Workers' Representatives
Vertreter der Arbeitnehmer
Rappresentanti dei lavoratori
Vertegenwoordigers v.d. werknemers
Repraesentent for arbejdstagerne

Conseillers Techniques
Technical Advisers
Technische Berater
Consiglieri tecnici
Technische adviseurs
Teknisk radgiver

Observateurs
Observers
Beobachter
Osservatori
Waarnemers
Observatør

REPUBLIQUE FEDERALE D'ALLEMAGNE / FEDERAL REPUBLIC OF GERMANY / BUNDESREPUBLIK DEUTSCHLAND / REPUBBLICA FEDERALE TEDESCA / BONDSREPUBLIEK DUITSLAND / FORBUNDSREPUBLIEKKEN TYSKLAND

Ministerialrat Dr. Ing. R. LINTZEN
Referat III A 1
Bundesministerium für Wirtschaft
Villemombler Strasse 76
5300 BONN

Herrn Bergwerksdirektor G. HURCK
Mitglied des Grubenvorstandes der
Gewerkschaft August Victoria
Victoriastrasse 43
4370 MARL

Herrn H. BRINKHOFF
I.G. Bergbau und Energie
Hauptverwaltung
Alte Hattinger Strasse 19
4630 BOCHUM

Dipl. Ing. A. COENDERS
Präsident des Landesoberbergamts
Nordrhein-Westfalen
Goebenstrasse 25-27
4600 DORTMUND

Dipl. Ing. K. HORNEFFER
Bundesministerium für Arbeit und
Sozialordnung
5300 BONN

Berghauptmann G. SEYL
Leiter des Oberbergamts für das
Saarland und das Land Rheinland-
Pfalz
Am Staden 17
6600 SAARBRUCKEN

Ministerialrat H. BERG
Ministerium für Wirtschaft,
Mittelstand und Verkehr
Land Nordrhein-Westfalen
Haroldstrasse 4
4000 DUSSELDORF

Dipl. Ing. G. FUERER
Präsident des Oberbergamtes
Clausthal-Zellerfeld
Hindenburgplatz 9
3392 CLAUSTHAL-ZELLERFELD

BELGIQUE / BELGIUM / BELGIEN / BELGIO / BELGIE / BELGIEN

J. MEDAETS
Directeur Generaal der Mijnen
Ministerie van Economische Zaken
30, rue De Mot
1040 BRUXELLES

G. DEQUELDRE
Conseiller à l'Institut d'Hygiène
des Mines
22, Hovermarkt
3500 HASSELT

J. OLYSLAEGERS
Président National de la Centrale
Syndicale des Travailleurs des
Mines de Belgique
8, rue Joseph Stevens
1000 BRUXELLES

(Statiestraat 78 A
3530 HOUTHALEN)

E. VANDENDRIESSCHE
Secrétaire général de la Centrale
des Franco-mineurs
113, rue Trasegnies
6180 COURCELLES

J. STASSEN
Inspecteur général des Mines
49, rue des Augustins
4000 LIEGE

FRANCE / FRANCE / FRANKREICH / FRANCIA / FRANKRIJK / FRANKRIG

M. BOULICAULT
Ingénieur en Chef des Mines
Chef du Service des Techniques du
Sous-sol
Ministère de l'Industrie
99, rue de Grenelle
75700 PARIS

M. BIEAU
Service Technique des Charbonnages
de France
9, avenue Percier
75800 PARIS

J. FOUBET
86, avenue Emile Zola
75015 PARIS

S. NOWAK
Secrétaire du Syndicat des Mineurs
2, rue Nansen
62300 LENS

L. KOCH
Ingénieur général des mines
Conseil général des Mines
Ministère de l'Industrie et de la
Recherche
5, rue Barbet de Jouy
75700 PARIS

B. SCHNELL
Conseil général des Mines
Ministère de l'Industrie et de la
Recherche
5, rue Barbet de Jouy
75700 PARIS

LUXEMBOURG / LUXEMBURG / LUSSEMBURGO

A. SCHUSTER
Ingénieur
Directeur du Travail et des Mines
Inspection du Travail et des Mines
2, rue des Girondins
LUXEMBOURG

A. RAUCHS
Ingénieur Principal
ARBED
ESCH/BELVAL

J. BIRDEN
Directeur Adjoint du Travail et des
Mines
2, rue des Girondins
LUXEMBOURG

ITALIE / ITALY / ITALIEN / ITALIA / ITALIE

Prof. Dott. Ing. A. GALATI
Ministerio dell'Industrie e del
Commercio
Direzione generale delle miniere
Via Veneto 33
00100 ROMA

Ing. F. SCIUTO
Direzione generale Miniere
Direttore della divisione V dell'
Ufficio Nazionale Minerario per gli
Idrocarburi
Via Molise 2
00187 ROMA

Prof. M. CARTA
Istituto arte mineraria della
facoltà d'ingegneria
Piazza d'Armi
09100 CAGLIARI

Dott. Giorgio CRAVIOTTO
E.T.S.I. - C.I.S.L.
Via Tevere 46
00198 ROMA

Dott. C. MICHELAZZI
Ispettore generale del Ministero
del Lavoro e della Previdenza Sociale
Via Andrea Fulvio 10
00162 ROMA

Dott. N. RICCIARDI-TENORE
Ispettore generale medico
Capo del' Ispettorato Medico
Centrale del Lavoro
Ministero del Lavoro e della
Previdenza Sociale
Via XX Settembre 97c
00187 ROMA

PAYS-BAS / NETHERLANDS / NIEDERLAENDE / PAESI-BASSI / NEDERLAND / NEDERLANDENE

J.W. DE KORVER
Inspecteur generaal der mijnen
Staatstoezicht op de mijnen
J.W. Frisolaan 3
2517 JS - DEN HAAG

M. VAN DER EIJK
Operations Manager
Nederlandse Aardcliemaatschappij BV
Schepermaat 2
9405 TA - ASSEN

Th. M. JANSEN
Inspecteur der mijnen
Staatstoezicht op de mijnen
Apollolaan 9
6411 BA - HEERLEN

IRLANDE / IRELAND / IRLAND / IRLANDA / IERLAND

J. STAPLETON
Principal officer
Department of Labour
Anley House
Mespil Road
DUBLIN 4

J.M. LAYDEN
Arigna Collieries
Arigna, Co Leitrim
CARRICK-ON-SHANNON

S. TRACEY
Natural Resources Unit
Irish Transport and General
Workers Union
Liberty Hall
DUBLIN 1

J. SINCLAIR
Grade 1 Industrial Inspector
Department of Labour
Anley House
Mespil Road
DUBLIN 4

ROYAUME UNI / UNITED KINGDOM / VEREINIGTES KOENIGREICH / REGNO UNITO / VERENIGD KONINKRIJK / DET FORENEDE KONGERIGE

A. HARLEY
Chief Inspector of Mines and Quarries
Health and Safety Executive
Regina House
259/269 Old Marylebone Road
LONDON NW1 5RR

B. GODDARD
Director of Mining Environment
National Coal Board
The Lodge
South Parade
DONCASTER - Yorkshire

R. McGAHEY
Vice President of the National
Union of Mineworkers
5, Hillside Crescent
EDINBURGH
Scotland

A. BULMER
Head of Safety and Engineering
Department
National Union of Mineworkers
222, Euston Road
LONDON NW1 2BX

E.J.H. NICHOLAS
Health and Safety Executive
Safety Policy Division Branch C
Regina House
259/269 Old Marylebone Road
LONDON NW1 5RR

J.S. MARSHALL
Deputy Chief Inspector of Mines
and Quarries
Health and Safety Executive
Regina House
259/269 Old Marylebone Road
LONDON NW1 5RR

188

DANEMARK / DENMARK / DAENEMARK / DANIMARCA / DENEMARKEN / DANMARK

B. SVENDSEN
Fabriksinspektør
Arbejdstylnet Groenlands Kreds
Direktoratet for Arbejdstylnet
Rosenvaengets Allee 16
2100 KØBENHAVN Ø

K. SPRUNK-JANSEN
Direktør
Greenex A/S
Landemaerket 10
1119 KØBENHAVN K

D. BUCH
Afdelingsingeniør
Ministeriet for Groenland
Hausergade 3
1128 KØBENHAVN K

ORGANISATION INTERNATIONALE DU TRAVAIL / INTERNATIONAL LABOUR ORGANIZATION / INTERNATIONALE ARBEITSORGANISATION / ORGANIZZAZIONE INTERNAZIONALE DEL LAVORO / INTERNATIONALE ARBEIDSORGANISATIE / I.L.O.

M. le Directeur Général du
B.I.T.
1211 GENEVE 22

STUDIES COMPLETED DURING THE LAST FIVE YEARS

STUDIES COMPLETED DURING THE PERIOD 1976-1980

Study No.	SUBJECT	AUTHOR(S)	YEAR
172/76	Evaluation of data on accidents in coal mines between 1972 and 1974	Mr Champagnac 93, rue Falguiere F - 75015 Paris	1975-1976
45/77	Safety and health protection when diesel motors are used underground in mines.	Mr Staehler Oberbergamt Schönhäuser Strasse 14 D-4600 Dortmund	1976-1977
325/77	Tests on fire-resistant conveyor belting for use underground in coal mines	INIEX CERCHAR VERSUCHSGRUBENGESELLSCHAFT NCB SCIENTIFIC CONTROL	1976-1977

STUDIES COMPLETED DURING THE PERIOD 1976-1980

(continued)

Study No	SUBJECT	AUTHOR(S)	YEAR
532/77	Review and evaluation of measures concerning the safety training of miners in the European Community coal mining industry.	Mr Roettger Brassertstrasse 5 D-4600 Dortmund	1976-1977
361/77	Safety and health hazards in prospecting for and production of petroleum and gas.	Mr Wilson 1, Bassett Gardens Blackhouse Hill Hythe CT 21 5UY, Kent	1976-1977
602/77	Toxicological tests on fire-resistant hydraulic transmission liquids based on esters and phosphates (anatomical pathology study).	CERCHAR B.P. No 2 F-60550 Verneuil-en- Halatte	1976-1977
603/77	Study on strata mechanics to prevent rock-bursts, whether or not linked to sudden outbursts of firedamp.	CERCHAR B.P. No 2 F-60550 Verneuil-en- Halatte	1976-1977
324/77	The use of self-rescuers in European coal mines.	Mr Chamberlain Donnybrook Kewferry Road Northwood - Middlesex	1977

STUDIES COMPLETED DURING THE PERIOD 1976-1980

(continued)

Study No	SUBJECT	AUTHOR(S)	YEAR
360/77	Exploratory study on the hazards connected with the use of explosives, and particularly new explosives, and on new shotfiring methods in the extractive industries.	Mr Goffart Administration des Mines Ministere des Affaires Economiques 30, rue de Mot B-1040 Brussels	1977
398/77	An example of a statistical study on accidents due to falls of rock.	CERCHAR B.P. No 2 F-60550 Verneuil-en- Halatte	1976-1977
395/78	Summary report on the second part of the study on safety and health protection when diesel motors are used underground in mines, with particular reference to existing regulations on this matter in the Member States of the European Community (cf. study 45/77).	Mr Staehler Oberbergamt Schönhäuser Strasse 14 D-4600 Dortmund	1977-1978
397/78	An initial study of the possibilities available for giving to each underground worker a means of escape in irrespirable atmospheres which may be deficient in oxygen following either an explosion, fire or outbursts of gas.	Mr Chamberlain Donnybrook Kewferry Road Northwood - Middlesex	1977-1978

STUDIES COMPLETED DURING THE PERIOD 1976-1980

(continued)

Study No	SUBJECT	AUTHOR(S)	YEAR
494/78	Comparison of current regulations in Member States relating to the installation and use of electrical equipment for use underground in gassy mines - Presentation of proposals for harmonization of the regulations.	Mr Moullin National Coal Board The Lodge South Parade Doncaster DN1 2 DX	1977-1978
559/78	An initial study of the possibilities available for the examination of winding and guide ropes in situ; a comparison of the methods available and the comparing of these results with those obtained by other currently used methods.	The Health and Safety Executive Red Hill Sheffield S3 7HQ	1977-1978
271/79	Establishment of the acute toxicity of fire resistant fluids by intra-muscular injection.	CERCHAR B.P. No 2 F-60550 Verneuil-en- Halatte Prof. Benthe Universitätskrankenhaus Eppendorf Pharmakologisches Institut der Universität Martinistrasse 52 2 Hamburg 20	1978-1979

STUDIES COMPLETED DURING THE PERIOD 1976-1980

(continued)

Study No	SUBJECT	AUTHOR(S)	YEAR
272/79	The possibilities available for giving to each underground worker a means of escape in irrespirable atmospheres which may be deficient in oxygen following either fire, explosion or outbursts of gas (continued).	Mr Chamberlain Donnybrook Kewferry Road Northwood - Middlesex	1978-1979
466/78	A study of the additional risks to divers due to the working environment underwater associated with the search for and exploitation of petrol and gas.	Lennard and Associates. Ltd. 40 Broxburn Road Orpington Kent BR6 OAY	1978-1979
341/79	Possible toxicological effects of fumes generated during the combustion of conveyor belts and other plastic material likely to be used in mines.	Mr Makower National Coal Board Coal House Lyon Road Harrow - Middlesex	1978-1979

STUDIES COMPLETED DURING THE PERIOD 1976-1980
(continued)

Study No	SUBJECT	AUTHOR(S)	YEAR
345/79	Study on stabilizing the ventilation under ground in coal mines in the event of a fire in a main shaft.	Mr Schubert Hernestrasse 43-45 D-4630 Bochum Mr Champagne 93, rue Falguiere F-75015 Paris Mr Stenuit 66, avenue de la Liberation B-1640 Rhode St. Genese	1978-1979
346/79	Study on rope guides in deep shafts for heavy loads and high speeds.	Messrs Slonina and Stuehler Versuchsgrubengesellschaft mbH Tremoniastrasse 13 D-4600 Dortmund	1978-1979
475/80	Oxygen self-rescuers	Messrs Catto and Smith National Coal Board Coal House Lyon Road Harrow - Middlesex	1979-1980
137/80	Interpretation and explanation of the proposed harmonized regulations for installation and use of electrical apparatus in mines of the European Communities.	Mr Loynes Melrose Crescent Hall GB - Altringham Cheshire, WA1 58NN	1979-1980

STUDIES COMPLETED DURING THE PERIOD 1976-1980

(continued)

Study No	SUBJECT	AUTHOR(S)	YEAR
429/80	The possibilities of harmonising the test procedures for the fire-resistant properties of fluids used for hydraulic power transmission in mines.	Mr Cutler Safety in Mines Research Establishment Safety and Health Executive Harpur Hill Buxton Derbyshire	1979-1980
471/80	The detection of tectonic stress concentrations in deep mines liable to cause rockbursts.	Mr Brauener Bergbau Forschung GmbH 61 Franz Fischer Weg D-4300 Essen 13	1979-1980
658/80	Behaviour training to identify and assess those methods of training which can influence the attitude of mature mine workers in the Community towards increased safety and health at work.	Mr Riddell National Coal Board Hobart House GB London SI 1X 7AE	1979-1980

XK0221003ENC