COMMISSION OF THE EUROPEAN COMMUNITIES

19th REPORT of the Safety and Health Commission for the mining and other extractive industries

YEAR 1981

VOLUME 1

Volume 1: Annual Report
Volume 2: Annexes to the Report

EUR 9151 EN

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SECTION I

COAL MINING ACTIVITIES

STATISTICAL ASPECTS OF THE COAL ECONOMY IN 1981

1.1. The following information was extracted from the SOEC's bulletin of 26 January 1982.

1.1.1. For the Community as a whole, the main trends in the coal economy during 1981 were:

- a slight fall in coal production (-1.6 million tonnes) accompanied by a marked increase in mine productivity (record level of 434 kg per man/hour), but also a decrease of roughly the same proportions in the number of miners employed underground (5 700 miners less as a yearly average);
- a marked drop in total sales, mainly as a result of a significant falloff in deliveries to coking plants (-3.4 million tonnes); demand from electrical energy producers was only slightly lower because of a strong stockbuild in power stations;
- a falloff in overall imports from third countries (-3.6 million tonnes) because of contraction of the supply side of the international market, largely as a result of the economic situation in Poland; at the same time, there was a sizeable increase in exports of German and British coal to third countries;
- as a result of the above, a further and significant increase in both pit-head coal stocks (+ 8.9 million tonnes) and stocks held by the main energy transformers (power stations and coking plants);
- lastly, a significant drop of approximately 5% in both production of and demand for hard coke as a result of the recession in the iron and steel undustry.

Community coal production reached a total of 245.7 million tonnes in 1981, which represents a fall of 0.6% over 1980. This falloff was mainly due to the decrease of almost 3 million tonnes in the United Kingdom, but it should be pointed out that U.K. output figures had been particularly high in 1980. On the other hand, in the Federal Republic of Germany and in France domestic production increased slightly.

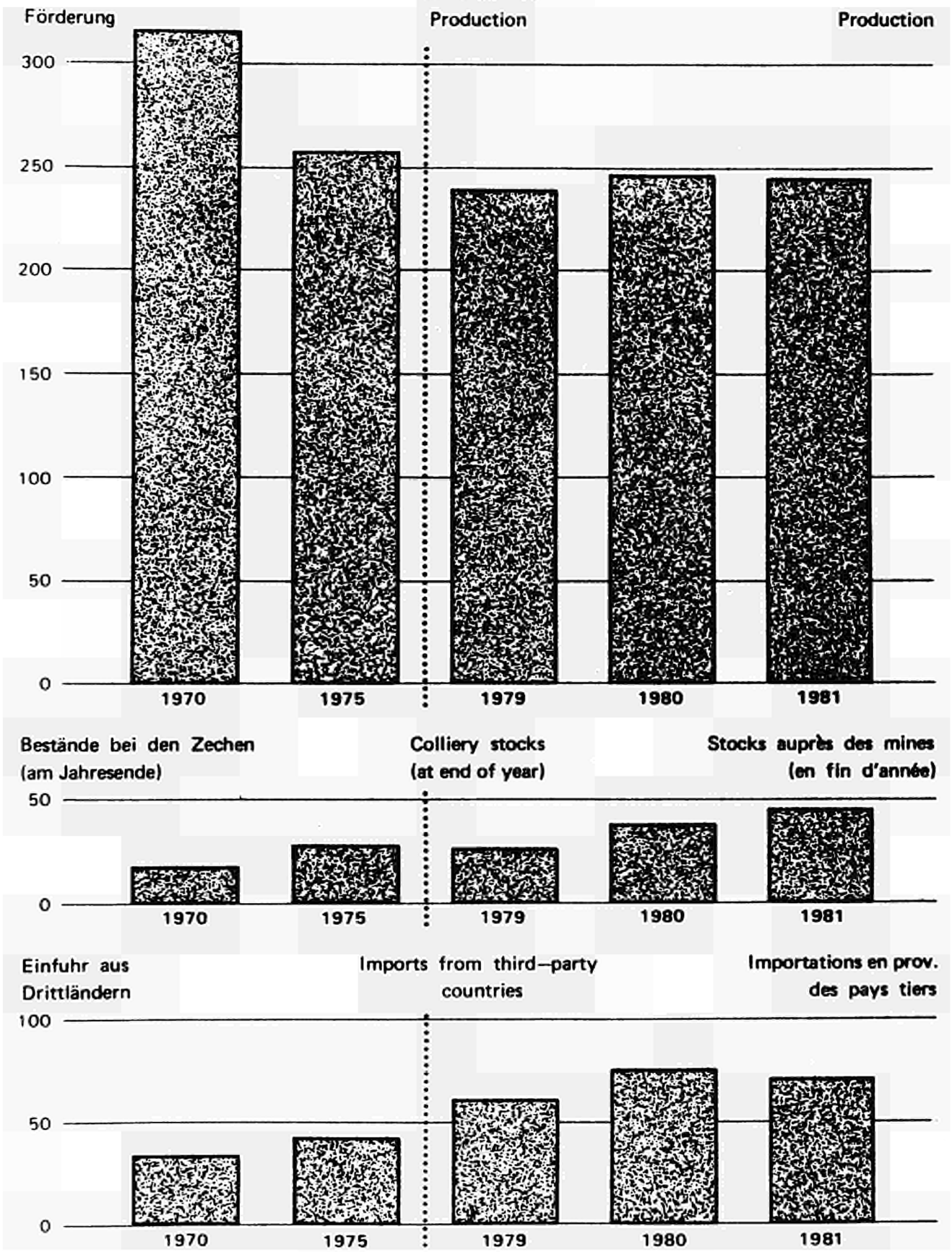
The number of miners employed underground fell by approximately 10 000 between the beginning and end of 1981. As an annual average this decrease was only 5 700 compared to 1980, but it varied considerably from one producer country to another. In the Federal Republic of Germany there was an increase in employment, whereas in France and particularly in the United Kingdom (-9 000 during 1981), there were significant drops. On the other hand, it was in the latter two countries that productivity increased most markedly, reaching record levels.

End-of-year pithead stocks amounted to more than 46 million tonnes for the Community, a record figure which represents the equivalent of a little more than two months'output. All the producer countries showed an increase in stocks: 48% of these stocks are held by the United Kingdom, 36% by the Federal Republic of Germany and 16% by France.

STEINKOHLE | HARD COAL | HOUILLE

EUR 10

10^6 t (t = t)



ERSTE ERGEBNISSE ZUR LAGE IN DER KOHLENWIRTSCHAFT FÜR DAS JAHR 1981

(Vorläufige Angaben)

FIRST RESULTS ON THE COAL INDUSTRY IN 1981

(Provisional data)

PREMIERS RESULTATS SUR L'ACTIVITE CHARBONNIERE EN 1981

(Données provisoires)

	EUR 10	BR DEUTSCHLAND	FRANCE	ITALIA	NEDERLAND	BELGIQUE BELGIË	LUXEMBOURG	UNITED KINGDOM	IRELAND	DANMARK	ELLAS
STEINKOHLE Förderung					HARD COAL Production 1 000 t (t=t)						HOUILLE Production
1979	238 748	93 312	18 611	-	-	6 125	-	120 637	63	-	-
1980	247 225	94 492	18 136	-	-	6 324	-	128 208	65	-	-
1981	245 652	95 565	18 589	-	-	6 136	-	125 293	69	-	-
1980/79	+ 3,6%	+ 1,3%	- 2,6%			+ 3,2%		+ 6,3%	+ 3,2%		
1981/80	- 0,6%	+ 1,1%	+ 2,5%			- 3,0%		- 2,3%	+ 6,2%		
Beschäftigte unter Tage (Jahresdurchschnitt)					Personnel employed underground (yearly average) 1 000						Personnel employé au fond (moyenne annuelle)
1980	353,1	121,6	30,4	-	-	16,4	-	184,4	0,3	-	-
1981	347,4	124,0	28,9	-	-	16,2	-	178,0	0,3	-	-
1981/80	- 1,6%	+ 2,0%	- 4,9%			- 1,2%		- 3,5%	-		
Leistung unter Tage je Mann und Stunde					Output per man and hour underground kg = kg						Rendement au fond par homme-heure
1980	426	539	352	-	-	279	-	382	-	-	-
1981	434	535	380	-	-	267	-	392	-	-	-
1981/80	+ 1,9%	- 0,7%	+ 8,0%			- 4,3%		+ 2,6%			
Bestände bei den Zechen (am Jahresende)					Colliery stocks (at end of year)						Stocks auprès des mines (en fin d'année)
1979	26 497	12 236	3 836	-	-	150	-	10 245	30	-	-
1980	37 202	13 306	5 798	-	-	164	-	17 904	30	-	-
1981	46 055(*)	16 366 (*)	7 350	-	-	192	-	22 117	30	-	-
1980/79	+ 40,4%	+ 8,7%	+ 51,1%			+ 9,3%		+ 74,8%	-		
1981/80	+ 23,8%	+ 23,0%	+ 26,8%			+ 17,1%		+ 23,5%	-		
Einfuhr aus Drittländern					Imports from third-pary countries 1 000 t (t=t)						Importations en prov. des pays tiers
1979	59 972	6 986	19 547	11 180	3 844	5 900	174	4 047	1 077	6 689	628
1980	74 447	7 265	22 632	14 299	5 022	7 337	215	7 175	910	9 060	532
1981	70 846	8 300	20 100	15 500	5 600	7 246	250	4 000	850	8 900	100
1980/79	+ 24,1%	+ 5,5%	+ 15,8%	+ 27,9%	+ 30,6%	+ 24,4%	+ 23,6%	+ 77,3%	- 15,5%	+ 35,4%	- 15,3%
1981/80	- 4,8%	+ 14,2%	- 11,2%	+ 8,4%	+ 11,5%	- 1,2%	+ 16,3%	- 44,3%	- 6,6%	- 1,8%	- 81,2%
STEINKOHLENKOKS Erzeugung					HARD COKE Production						COKE DE FOUR Production
1979	67 533	26 697	11 615	7 501	2 530	6 451	-	12 511	-	-	228
1980	66 877	28 669	11 118	8 283	2 455	6 048	-	10 058	-	-	246
1981	63 518	28 158	10 700	8 100	2 250	5 925	-	8 335	-	-	50
1980/79	- 1,0%	+ 7,4%	- 4,3%	+ 10,4%	- 3,0%	- 6,2%		- 19,6%			+ 7,9%
1981/80	- 5,0%	- 1,8%	- 3,8%	- 2,2%	- 8,4%	- 2,0%		- 17,1%			- 79,7%
Bestände bei den Kokereien (am Jahresende)					Stocks at coking plants (at end of year)						Stocks auprès des cokeries (en fin d'année)
1979	9 916	6 820	535	422	22	108	-	1 982	-	-	27
1980	10 726	6 480	602	661	40	106	-	2 789	-	-	48
1981	10 446(*)	7 035 (*)	700	600	15	110	-	1 956	-	-	30
1980/79	+ 8,2%	- 5,0%	+ 12,5%	+ 56,6%	+ 81,8%	- 1,9%		+ 40,7%			+ 77,8%
1981/80	- 2,6%	+ 8,6%	+ 16,3%	- 9,2%	- 62,5%	+ 3,8%		- 29,9%			- 37,5%

(*) einschliesslich Lager Notgemeinschaft

Steinkohle : 7 260 10^3 t
Koks : 2 977 10^3 t

(*) including German non-colliery producer stocks

Hard coal : 7 260 10^3 t
Coke : 2 977 10^3 t

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

Houille : 7 260 10^3 t
Coke : 2 977 10^3 t

Millionen Tonnen | millions of tonnes | millions de tonnes

	EUR 10	BR DEUTSCHLAND	FRANCE	ITALIA	NEDERLAND	BELGIQUE BELGIË	LUXEMBOURG	UNITED KINGDOM	IRELAND	DANMARK	ELLAS
STEINKOHLE				HARD COAL							HOUILLE
Lieferungen an zecheneigene und öffentliche Kraftwerke (*)				Deliveries to public power stations and to pithead power stations (*)				Livraisons aux centrales électriques des services publics et des mines (*)			
1979	166,5	39,6	25,2	3,2	1,1	4,6	-	86,3	0,0	6,6	-
1980	179,1	40,2	25,5	4,9	1,4	5,5	-	92,0	0,1	9,5	-
1981	178,5	42,7	24,0	6,5	2,5	5,4	-	87,0	0,1	10,3	-
1980/79	+ 8%	+ 2%	+ 1%	+ 53%	+ 27%	+ 20%		+ 7%		+ 44%	
1981/80	- 0%	+ 6%	- 6%	+ 33%	+ 79%	- 2%		- 5%	-	+ 8%	
Lieferungen an die Kokereien				Deliveries to coking plants							Livraisons aux cokeries
1979	88,0	34,1	14,5	9,9	3,6	8,5	-	17,1	-	-	0,4
1980	87,9	36,8	14,7	11,3	3,6	7,9	-	13,3	-	-	0,4
1981	84,5	36,4	14,0	10,8	3,3	7,6	-	12,3	-	-	0,1
1980/79	- 0%	+ 8%	+ 1%	+ 14%	-	- 7%		- 22%			-
1981/80	- 4%	- 1%	- 5%	- 4%	- 8%	- 4%		- 8%			- 75 %
STEINKOHLENKOKS				HARD COKE							COKE DE FOUR
Lieferungen an die Eisen- und Stahlindustrie				Deliveries to iron and steel industry							Livraisons à l'industrie sidérurgique
1979	58,9	20,0	11,3	6,2	2,5	6,7	2,3	9,5	-	0,1	0,3
1980	54,2	19,8	11,6	6,4	2,3	6,3	2,3	5,3	-	0,1	0,2
1981	51,1	19,2	10,2	6,2	2,3	5,9	1,8	5,3	-	0,1	0,1
1980/79	- 8%	- 1%	+ 3%	+ 3%	- 8%	- 6%	-	- 44%		-	- 33%
1981/80	- 6%	- 3%	- 12%	- 3%	-	- 6%	- 22%	-		-	- 50%

(*) einschließlich Bergbauverbundkraftwerke und die Kraftwerke der Bundesbahn (Bundesrepublik Deutschland)

(*) including Bergbauverbundkraftwerke and Federal railways power stations (Federal Republic of Germany)

(*) y compris les Bergbauverbundkraftwerke et les centrales des chemins de fer fédéraux (République fédérale d'Allemagne)

1.1.2. SUMMARY OF ACCIDENTS WHICH OCCURRED IN UNDERGROUND COAL MINES

For five years it has been possible to carry out this analysis for the Community of the Nine, including the four main producer countries : the United Kingdom, the Federal Republic of Germany, France and Belgium. 561,93 million hours were worked as against 564,71 the previous year.

1.1.2.1. The total number of accident victims incapacitated for more than three days or killed is 70.534 as against 74.102 for the preceding year. The frequency rate (number of victims for each million working hours) is 152,52 as against 131,22, i.e. a decrease of 4,34%.

1.1.2.2. Accidents causing between 4 and 20 days of absence from work numbered 46.164, i.e. a frequency rate of 82,15, representing a decrease of 5,59 % over the preceding year, when it was 87,01.

1.1.2.3. Accidents causing between 21 and 56 days of absence from work numbered 18.339, i.e. a frequency rate of 32,64, representing a decrease of 4,17 % over the previous year, when it was 34,06.

1.1.2.4. Accidents causing more than 56 days of absence from work numbered 5.922, i.e. a frequency rate of 10,54, which represents an increase of 6,68 % compared with 9,88 for the preceding year.

1.1.2.5. The number of fatal accidents is 109, including one group accident (8 deaths). The preceding year there were 141 fatalities with one group accident (2 deaths). The frequency rates are as follows :

- including group accidents: 0,19 representing a decrease of 24 % over the figure of 0,25 for the preceding year.
- excluding group accidents: 0,18 representing a decrease of 26,83 % over the figure of 0,246 for the preceding year.

1.1.2.6. A more detailed analysis, taking into account figures for the four previous years and the main causes of accidents, can be referred to in Section III.

1.2. ACTIVITIES OF ALL THE EXTRACTIVE INDUSTRIES

1.2.1. Section IV comprises tables giving the same data as for last year by country. Harmonization of this information is not sufficient to allow a Community table to be drawn up.
These tables include :
- a group of minerals which appear to lend themselves to an initial comparison most easily;
- a second group of more diversified minerals which are not uniform but which are significant for the country concerned in terms of production or value.

1.2.2. The number of plants or undertakings, the production and production unit is given for each product.

1.2.3. A distinction is made between three types of working : underground, opencast and by borehole.
The manpower figures for each of these types of working does not, as far as possible, include administrative or commercial staff and those involved in mineral processing but do include workers employed on preparation (crushing, concentration, washing, loading).

1.3. THE COMMUNITY'S DEPENDENCE ON ENERGY

The figures given in the following table are taken from bulletins of the Statistical Office of the European Communities dated 6.5.1982 on "Hydrocarbons" and 19.3.1982 on "Coal".

1.3.1. The development in the coal market has already been commented on at the beginning of this chapter. There was a slight drop in production whilst third country imports remained the same.

1.3.2. Lignite production remained almost the same as in the preceding year.

1.3.3. Oil production increased appreciably (12,5 %) whilst oil imports slumped (17,6 %).

1.3.4. Gas production decreased once again (2,9 %) in 1981 and third country imports increased (5,8 %).

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	-
	1981	245,6	95,5	18,6	-	-	6,1	-	125,3	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
	1981	73,9	8,1	20,1	14,7	5,4	7,2	2,2	7,2	0,86	8,7
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	-	-	-	-	-	-
	1981	135,5	130,6	3,0	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
	1981	99,5	4,5	1,7	1,5	1,6	-	-	89,5	-	0,8
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
	1981	342,3	65,1	88,9	89,3	34,6	26,3	-	34,6	0,6	3,1
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	-
	1981	5835,0	680,0	276,7	537,7	2833,6	1,5	-	1453,3	52;2	-
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	-	-
	1981	2092,2	728,0	429,3	282,9	117,9	86,0	-	448,2	-	-

(X) Taken from Eurostat publications of 19 March 1982 and 6 May 1982.
(XX) At 35,17 Megajoules/m^3 0° 1,01 bar, 1.000 Terajoules = 28,4 x 10^6 m^3.

GENERAL ACTIVITIES OF THE SAFETY AND HEALTH COMMISSION FOR THE MINING AND OTHER EXTRACTIVE INDUSTRIES

1. Meetings held

The Safety and Health Commission for the Mining and Other Extractive Industries met twice, on 3 April and 17 November 1981.

Each of these meetings was prepared by meetings of the Restricted Committee on the previous day.

The Working Parties met 15 times; restricted committees of experts met in order to prepare the meetings.

The Working Party on Rescue, Arrangements, Mine Fires and Underground Combustion held one meeting outside Luxembourg, on 31 March and 1 April 1981. The Working Party visited the Dortmund experimental mine and the Ramsbeck inclined gallery.

The Working Party on Mecanization held one meeting outside Luxembourg on 9 and 10 June 1981 when it visited the Hugo colliery in Gelsenkirchen (9 June 1981). On 10 June 1981, it visited the Ibbenbüren mine near Osnabrück.

The Working Party on Strata Control and Stability of Ground met on 6 and 7 October 1981 in Grosseto and visited the pyrites mines in that region.

An Ad hoc Committee of Experts was set up as a result of the decision taken by the Safety and Health Commission on 23 October 1980 to carry out work on the use of diesel engines underground.

Symposia were held on 5 November 1981 and 19 and 20 November 1981.

The subject of the first symposium was the prevention of the dust explosion hazard.

The second was organized for workers' representatives, with a view to informing them of the recent activities of the Safety and Health Commission and the ECSC research work in the fields of industrial safety and health and ergonomics. A study was also made of the results of research work carried out under the programme on humanization of working conditions subsidised by the German Ministry for Research and Technology. This congress was held in Haltern, Federal Republic of Germany, on the premises of the school of the Industriegewerkschaft Bergbau und Energie trade union for the mining and energy sectors.

On 1 June 1981, Mr Ivor Richard, Commissioner responsible for Social Affairs in the Commission and Chairman of the Safety and Health Commission, met a delegation consisting of representatives of the Safety and Health Commission in Brussels and was informed of a number of current problems relating to the extractive industries, and to the Safety and Health Commission's tasks and functioning.

Mr Richard was kind enough to attend the November 1981 meeting.

2. Group accidents

In 1981, a group accident occurred on 26 August in the Ibbenbüren mine (Preussag AG. Kohle). It was caused by an instantaneous firedamp and coal outburst and killed eight miners, injuring seven others.

A preliminary report on this accident was made to the November meeting of the Safety and Health Commission and some conclusions were drawn as to the topics which should be referred to the Working Parties for examination.

3. Decisions of the Safety and Health Commission

The following were approved during 1981:

- The minimum requirements for preventing and combatting firedamp ignitions caused by power loaders, heading and ripping machines in mines of the Member States of the European Communities (Doc. 2487/5/80). Adopted on 3 April 1981.

- Minimum safety considerations to be taken into account when constructing, maintaining or removing tips and lagoons of any materials extracted from mines or quarries (Doc. 2484/7/80). Adopted on 3 April 1981.

- Proposal to the governments for well documentation (Doc. 3578/5/79).
  The aim here is to gather documentation making it possible to locate and describe the well. This documentation is especially important in the event of an emergency or blowout. Adopted on 17 November 1981.

- Proposal to governments for guidelines for procedures relating to rescue, evacuation and emergencies at offshore installations (Offshore drilling, production and accomodation installations) (Doc. 2523/5/79).
  This proposal was made in order to meet the requirements of § 3.3. of Safety and Health Commission Document N° 3318/6/77: 'The safety of operations depends largely on the skill of the workforce. Regular protective safety drills and safety meetings should be held'. Adopted on 17 November 1981.

- Proposal to governments for a method of presenting statistics of accidents resulting from the exploration for and exploitation of minerals by borehole (offshore) (Doc. 2897/4/81).

  This proposal is put forward in accordance with Article 1 of the Council Decision of 27 June 1974 extending the terms of reference of the Safety and Health Commission to cover all the extractive industries. Adopted on 17 November 1981.

- On 17 November 1981, the Safety and Health Commission also approved Doc. 4276/1/81: 'The reporting of dangerous occurrences arising from the exploration for and exploitation of oil, gas and other materials extracted by borehole'.
  The aim of this proposal is to provide the Safety and Health Commission with objective information on dangerous occurrences in the Member States in order to arrive at findings which help to avoid these situations recurring elsewhere.

- Report on the safety campaigns organized in the extractive industries of the European Community (Doc. 3733/8/81).

4. Symposium on flammable dusts (5 November 1981)

Pursuant to the decision taken in October 1980 (see Chapter D - Flammable Dusts - of the 18th Report), a symposium on the dust explosion hazard was held in Luxembourg and attended by 50 people, selected from amongst colliery managers, research workers and safety staff.

A total of 16 papers were presented and they were followed by a discussion and a general summing-up. The topics selected concerned triggered barriers (6 papers), present use of barriers (2 papers), the study of dust deposits, dust neutralization by salt pastes and powders, the problem of multiple explosions and control of weak dust explosions.

A film made by Charbonnages de France, with Community financial assistance, was shown.

This conference provided the opportunity to make an up-to-the-minute assessment of progress in dust explosion prevention and of the experience gained in research work undertaken in this field by specialized institutes, many of which are in receipt of Community financial assistance.

The participants and the Safety and Health Commission felt that this one-day oongress was of great interest, and it was proposed and decided that the papers should be widely disseminated.

As it had been hoped, this symposium gave new impetus to the activities of the specialized Working Party.

5. Congress for miners' trade unions (Haltern, 19 and 20 November 81)

The Safety and Health Commission in keeping with a long-established tradition, organized a congress for workers' representatives on 19 and 20 November 1981 in close cooperation with the trade union organizations.

Representatives from all the mining countries of the Community met in Haltern (90 participants, 7 nationalities).

The first day was devoted to the study and discussion of selected topics, mainly in the field of safety in transport and handling underground and ergonomics as applied to such operations.

These topics seemed especially well chosen in view of the shift noted in accident statistics, which show an increase in accidents due to transport and handling, whilst a reduction has been observed in accidents due to falls of ground at the face.

On the second day, several groups had the opportunity to visit installations relating to the subjects covered (transport, ventilation, safety training etc.).

A booklet containing the papers and reports will be circulated at a later date.

6. Safety campaigns

The two safety campaigns in coalmines enterd in the 1980 budget, but actually taking place in 1981, were both successfully completed.

The first, which was carried out in the Federal Republic of Germany, was on the handling of heavy loads.

The other, in Belgium, dealt with the improvement of postures and movements during handling, setting and removal of props and bars at faces and face ends.

Under the 1981 budget, it proved possible to finance two safety campaigns for 1982 on topical themes: in France, on the prevention of coal dust explosions, and in the United Kingdom, on the prevention of accidents in washing and screening plants.

At the end of the financial year, additional funds were made available which will enable campaigns to be launched in 1982 covering the following themes:

- prevention of accidents relating to falls, travelling and movement of miners underground (France);
- improvement of safety in exploiting and exploring for oil and natural gas (F.R. of Germany); a film is to be made on this campaign;
- action towards improving occupational safety for new entrants to the mining industry (F.R. of Germany - United Kingdom).

The Safety and Health Commission and the Commission of the European Communities have always been of the opinion that safety campaigns were important insofar as they contribute significantly towards safety mindedness and awareness of accident prevention methods.

The Safety and Health Commission would like to see those Member States which have not yet taken part in the organization of these campaigns now becoming involved, and workers in all the various extractive industries benefiting from such activities.

A document (No 3733/3/81) has just been published which is a summary report on the conduct of safety campaigns in the extractive industries in the European Communities since 1971.

To date, the Commission of the European Communities has granted financial assistance for 20 campaigns, 15 of which have taken place in collieries.

7. The functioning of the Safety and Health Commission and its Working Parties

The main characteristic of 1981 was a high level of activity by the Working Parties and Committees of Experts, despite the chronic staffing problems. The method of functioning declared and approved in item 7 of the 18th Report was adhered to. It had proved very effective to have the work prepared by select committees of experts entrusted with a clearly defined task.

Similarly, a fresh start had been made by the Working Parties on Health in Mines and Human Factors, which had reestablished a balance between technical matters and the psychological or sociological factors able to influence industrial safety and health.

A great deal of activity was devoted to the 'Oil and Gas' sector.

Lastly, item 4 above demonstrates that new impetus was given to the Working Party on Flammable Dusts.

8. Studies

The studies selected and undertaken in 1981 in the context of the activities of the Safety and Health Commission's Working Parties are as follows:

- Fire-resistant fluids - specifications and testing conditions for hydraulic fluids used for hydrostatic and hydrokinetic power transmission (Rapporteur Mr K. Clanzy);

- Toxicological effects of fumes produced by heating of conveyor belts and other plastic materials (Rapporteur: Mr Makower);

- Chemical oxygen self-rescuers: the influence of various factors (water, CO_2 in the exhaled air) on the effective life (Rapporteur: Mr Makower).

9. Problems of radiological protection against radon and its daughter products in Community mines

During 1977, the Safety and Health Commission's attention was drawn to the potential health hazard to miners presented by radon and its daughters. The Commission of the European Communities, and more specifically the Health and Safety Directorate, then entrusted the French Commissariat à l'Energie Atomique with a study intended to determine the quantities of radon and its daughter products present in mines.

Research was carried out in the following eight collieries: Zolder (Belgium), Hayange (France), Wittelsheim (France), Niccioletta (Italy), Gorno (Italy), Monteponi (Sardinia), Blanzy (Darcy) (France) and Messeix (France).

The research work started in 1979 and involved:

- measurement of external exposure to ionizing radiation;
- measurement of airbone radon concentrations;
- measurement of total alpha energy originating in radon daughters;
- measurement of the individual's exposure by means of personal dosimeters worn by selected miners.

The following results were obtained:

- external exposure to ionizing radiation is negligible;
- all the collieries studied showed a radon concentration below the limit value established by the Council Directive of 15 July 1980;
- individual doses measured by means of the personal dosimeters are also below the limit value given in the above Directive.

In the interim, the International Commission for Radiological Protection has published a recommendation prescribing values eight times lower. This recommendation has not yet been taken into account in the Directive.

Even if the lower values are applied, the readings obtained are still below the compulsory limits. However, in four of the collieries studied, radiological monitoring might perhaps be prescribed for specific categories of personnel.

The report on this series of measurements is now available.

10. Council Directives

a) 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' submitted to the Council of the European Communities on 1 February 1980 (see 18th Report) was examined at two meetings of the Council's Working Party on Economic Questions on 9 February and 10 April 1981.

At the end of the reference year, this Directive, which had been held up by terminological difficulties, had still to be discussed by the Council's Legal Linguistic Experts' Working Party.

It is to be expected that this work will be completed at the beginning of 1982.

b) As regards the follow-up to the Directive adopted on 27 November 1980 by the Council concerning the protection of workers from the risks related to exposure to chemical, physical and biological agents at work (frame-work Directive) (see paragraph 10 of the 18th Report and paragraph 1.4.5.4. of the 17th Report), the two Draft Directives relating to lead and asbestos were still under consideration at the Council at the end of 1981.

On 3 December 1981, the Council adopted a Directive on major accident hazards associated with certain industrial activities. This Directive, sometimes known as the 'Seveso Directive', is mainly aimed at preventing serious accidents which might be caused by specific industrial activities, and restricting their repercussions on the population, the environment and workers.

In addition, the staff of the Commission of the European Communities have drawn up a draft directive aimed at protecting

workers against the hazard of exposure to noise at work and have initiated preliminary consultations.

The contents of this Directive were explained to the Committee of Experts on Noise of the Safety and Health Commission on 19 October 1981 and to the full Safety and Health Commission on 17 November 1981.

At this meeting, the Safety and Health Commission reiterated its remarks on the observance of its powers and terms of reference and once more drew attention to the fact that 'due account ought to be taken of the specific nature of work underground in mines'. It is felt that the constant changes in workplaces in mines and their environmental constraints demand original solutions which only the responsible experts meeting within the Safety and Health Commission are capable of providing.

It has therefore been decided to continue the work in hand on reducing the exposure of underground workers to noise (see Working Party on Health in Mines).

11. Examination of the 18th Report of the Safety and Health Commission

The 18th report (1980) was approved by the Safety and Health Commission at its meeting on 3 April 1981.

12. Secretariat

A breakdown of the tasks allotted to the members of the Secretariat of the Safety and Health Commission in accordance with the existing Working Parties structure, is annexed to the present report.

Mr Jules Gillardin, who worked for several years in the Secretariat of the Safety and Health Commission, has been moved to a new post with the Directorate-General for Employment, Social Affairs and Education in Brussels.

At the end of 1981, we were apprised of the sad news of the death of Mr Georges Czech, at the age of 68. Until 1973, Mr Czech had expended all his energies in managing and extending the Safety and Health Commission, in which he had been involved since its inception. He was a friend to all and leaves us with the memory of an efficient, brave and highly devoted official.

SECTION II

ACTIVITIES OF THE WORKING PARTIES

SECTION II

ACTIVITIES OF THE WORKING PARTIES

CHAPTER A

RESCUE ARRANGEMENTS, MINE FIRES AND UNDERGROUND COMBUSTION

There were two full meetings of the Working Party, one in Dortmund on 31 March 1981 and the other in Luxembourg on 20 October 1981.

In addition, restricted Committees of Experts held two meetings on belt conveyors, three on self-rescuers and two on early detection of fires and heatings. A number of these meetings took place outside Luxembourg, in testing stations or laboratories.

Early detection of heatings remains a major problem for this Working Party. That is why it visited the Dortmund test colliery where it was able to examine comparative trials carried out with various systems aimed at detecting incipient belt heating.

An enlarged meeting was held on the same topic on 26 September 1980.

The next day, a visit was made to the abandoned ore mine in Ramsbeck, which houses an inclined test gallery for carrying out tests on various types of fire-resistant belt, in which the air speed can be varied for either ascensional or descensional ventilation.

A complete test rig was installed which makes it possible to see how the fire develops, what influence it has on ventilation and the distribution of fumes and gases. The latter question is vital in order to determine the possible effects of the products of combustion on the efficiency of filter self-rescuers, which are still in use in a large number of Member States.

A Committee of Experts has begun a study of methods of early detection and location of fires and heatings underground. It has made a great deal of progress in its work and its report is expected at the beginning of 1982. It would already seem, however, that the trend is towards systems adapted to specific collieries, and it would seem unlikely that a standardized system can be found.

Barthel burner and critical oxygen index testing was continued, and the end of the three-year period fixed when the document "Check testing of conveyor belts with textile carcass for use underground in coal mines - resistance to flame" (Doc. No 1479/8/77) was adopted by the Safety and Health Commission on 6 April 1978 is now in sight.

A great deal of information has been gathered in this period and a number of conclusions are already apparent. Firstly, it is clear that no test other than those selected has been accepted as valid for large batches of products.

The results obtained with the two methods cannot be compared and do not correlate with the results obtained by type approval testing on a larger scale (either the drum friction or propane burner tests).

However, the Barthel and critical oxygen index tests provide usefull pointers for belt manufacturers and users in selecting production methods and belt types. It would also seem that the Barthel burner test is best suited to belts with PVC covers and

the critical oxygen index to those with rubber/chloroprene (neoprene) covers.

A report is now being drafted and will be submitted to the Working Party and to the Safety and Health Commission at the beginning of 1982.

The Committee of Experts carrying out the study of chemical oxygen self-rescuers continued its work as proposed in the report (Doc. No 4936/8/78) approved by the Safety and Health Commission on 7 May 1980: "Guidelines for the construction and testing of chemical oxygen self-rescuers".

A document on this topic will shortly be submitted to the Safety and Health Commission. It will report on the practical experience gained in training and periodically retraining miners and in the maintenance of the apparatus.

In one Member State, large scale suitability testing, with financial assistance from the Community, is being carried out on three types of oxygen self-rescuers.

The Ibbenbüren accident (26 August 1981), in which eight miners died as a result of an instantaneous firedamp outburst, focuses attention on the benefits which would accrue from having a light, portable self-rescuer whose oxygen supply capacity would be sufficient to enable miners to escape from a cul-de-sac in which the atmosphere has become unbreathable as a result of a major gas outburst. The Working Party will examine the circumstances in which the accident occured before putting forward its proposals.

Work continued on preparation of the 6th report on the specifications and testing conditions for fire-resistant hydraulic fluids used in mines for hydrostatic and hydrokinetic power transmission. The expert's report is now available and will be submitted to the specialized Working Party at the beginning of 1982.

Reference should also be made to an interesting departure by the Working Party in the field of nitrogen neutralization of spontaneous combustion. A guide to the correct application of this technique, drawn up by one Member State, has been translated and is now available in English, French, German and Italian (Doc. No 3489/81). This document should be read with reference to that published in the 14th Report of the Mines Safety and Health Commission (Annex VIII).

CHAPTER B

WINDING ROPES AND SHAFT GUIDES, WINDING ENGINES AND WINCHES

The Working Party held two full meetings on 15 July 1981 and 10 December 1981, the necessary preparatory work being carried out at three restricted meetings.

Doc. No 2778/80 "Safety considerations in transport and man-riding in coalmines using rope-hauled monorail systems" was amended and updated. The final version will be submitted to the Safety and Health Commission at its meeting on 19 May 1982.

A great deal of activity was devoted to preparing the document on "Safety regulations for winding ropes and cappings" (Doc. No 5379/4/78) but it will only be possible to put it before the Safety and Health Commission at its last meeting in 1982 when the text has been finalized.

The Working Party received documentation which is useful as an aid to reliable assessment of the work capacity of dynamically stressed components of winding and haulage installations made of high-tensile steels (Dr H. Arnold)* .

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*) Dr H. Arnold died on 5 December 1980

The Working Party also acquainted itself with the report on the study which had received Community financial assistance on "Safety problems in the operation of overhead monorails, in particular when used for manriding and on sloping and curved sections" (Seilprüfstelle - Bochum).

Subsequently, it drew up a five-year work programme which in particular includes proposals for research projects to form part of the second Safety in Mines research programme (Article 55 of the ECSC Treaty).

CHAPTER C

ELECTRICITY

The full Working Party met on 16 and 17 September 1981, and two restricted meetings were also held in the course of the year.

Discussion at these meetings led to the establishment of the future work programme as follows:

1. work under voltage;
2. electrical equipment for use in all firedamp concentrations;
3. phase-earth faults;
4. connecting devices;
5. selection of types of protection according to the location in which they are used.

Study of "work under voltage" started in 1981.

Study of the other topics will begin in 1982.

The Council's Working Party on Economic Questions began its examination of 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* on 9 February 1981 and this was completed on 10 April (see also 18th Report of the Safety and Health Commission, page 39,2.).

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*) Official Journal of the European Communities No C 205.

The Legal/Linguistic Experts' Working Party of the Council still has to complete its examination of the directive, and this will be carried out when all the language versions are available, probably at the beginning of 1982.

The Working Party finalized the certificate of conformity required for implementation of the Directive. This certificate (Doc. No 3731/81) was adopted by the Safety and Health Commission on 3 April 1981 and communicated to the Council, which included it in the draft directive at Annex D.

CHAPTER D

FLAMMABLE DUSTS

In accordance with the decision taken in October 1980 by the Safety and Health Commission, the full Working Party met only once in the course of the year, on 6 November 1981. The day before this meeting a symposium was held for an audience of persons responsible for mines' safety.

During this symposium, the following three themes were covered:

- the use of water barriers and neutralization with salt powders and pastes;
- triggered barriers;
- multiple explosions, raising of dust into the air, weak dust explosions.

This seminar was an occasion for a very rewarding exchange of views of which use was made in drawing up an action programme to be implemented from 1982 onwards. This will include several groups of topics for consideration:

- research into the bases for the production of flammable dusts;
- explosible dust deposits, ways of preventing or removing them;
- the mechanics of explosions of dust, dust/gas mixtures and gas;
- rendering explosible dust harmless;
- preventing the occurence of ignition sources;

- suppressing dust, dust/gas and gas explosions.

CHAPTER E

COMMON ACCIDENT STATISTICS

The Working Party did not meet in 1981.

The need to prepare a mode of presentation for common statistics in the oil and gas sector and to examine accident statistics in the other extractive industries means that the Working Party will be able to resume its activities in 1982.

CHAPTER F

HEALTH IN MINES

The Working Party on Health in Mines as formerly constituted did not meet in 1981, but its composition was recast in order to meet its future responsibilities.

Two Committees of Experts carried out a great deal of preparatory work in the fields of respirable dust and noise.

The Committee of Experts on Respirable Dust met twice, on 14 April and 11 September 1981.

Its work was based on the Community research project on 'Studies to compare the various gravimetric dust measuring and evaluating methods used in the coal-mining industry of Member States of the European Communities' (Doc. No 2125/81 and published report).

The experts have delivered their opinion, which will be examined at the beginning of 1982 by the Working Party on Health in Mines.

It is possible, to state, without encroaching on the Working Party's right to draw its own conclusions, that the report concludes that there is a close correlation between the measurements of dust concentrations recorded by the different samplers, taken two by two in each country, the samplers being used in the same way as in their country of origin.

In addition, the assessments of dust-related hazards is similar in each country and the study has shown that, in general, the workings are ranked in the same order of hazard whatever the method employed. However, the implementation of the regulations differs from one country to another.

The Committee of Experts on Noise met twice, on 27 May and 19 October 1981.

Its work was based on two studies:

- Survey on noise in underground workings (by G. Degueldre) (Doc. No 3256/81).
- Noise in underground coal mines (by E. Palecki) (Doc. No 4197/1/80).

These two studies had largely the same objectives.

The Committee of Experts is now in a position to put forward proposals on the provisions to be enacted for underground workings in order to reduce operating noise levels and to provide protection for workers engaged in mining underground.

The Committee of Experts studied the proposal for a directive drawn up by the staff of the Commission of the European Communities on protection of workers against noise and expressed it views on this topic.

The Working Party on Health in Mines will have to form its own opinion of the above work and forward its conclusions to the Safety and Health Commission at the beginning of 1982.

CHAPTER G

HUMAN FACTORS AFFECTING SAFETY

During the reference year, the Working Party held two full meetings, prepared by four restricted meetings.

As stated in the 18th Report, a work programme was drawn up, submitted to an approved by the Safety and Health Commission (Doc. No 4794/1/80).

The Working Party has completed the "Report on Safety Campaigns Organized in the Extractive Industries of the European Community". This is a summary of the safety campaigns organized over the past ten years. The report contains interesting pointers with respect to the results obtained, the methods applied, the workers involved and data which will be useful for future campaigns.

The Safety and Health Commission adopted this report on 17 November 1981 (Doc. No 3733/3/81).

At the instigation of the Working Party, the Safety and Health Commission agreed that the following safety campaigns should be conducted in 1982 and that financial assistance would be requested for them from the European Communities:

- Protection of personnel against flammable dusts in coal mines (Charbonnages de France);
- Safety in coal preparation plants (National Coal Board);

- Improvement of safety in exploiting and prospecting for oil and natural gas - preparation of a film on this campaign (Steinbruchsberufsgenossenschaft-Hannover);
- Action towards improving industrial safety for beginners (Ruhrkohle AG - National Coal Board - Westfällische Berggewerkschaftskasse).

The Working Party continued, during the reference year, its work on drawing up three reports on the following topics:

- regulations and their application;
- examination of the study of "Refresher training in the French, German and United Kingdom mining industries";
- the participation of workers' representatives in the inspection of underground mines for safety and health purposes.

The Working Party devised a Community research project to be included in the Commission's second Safety in Mines research programme concerning the relationship between human factors and safety.

This project will be dealt with by Belgium, France, the Federal Republic of Germany and the United Kingdom and will have as its general theme: "Refresher safety training for miners and safety training for experienced miners".

CHAPTER H

VENTILATION, FIREDAMP AND OTHER MINE GASES

During 1981, the Working Party held one full meeting. Three restricted Committee meetings were also organized.

Following the accident in Golborne Colliery (Doc. 2031/80), the question arose of whether the circumstances of this accident did not call into question some of the minimum requirements for the ventilation of cul-de-sac workings adopted by the Safety and Health Commission on 7 May 1980 (Doc. No 3613/7/78).

This Working Party came to the conclusion that the above requirements fully covered all aspects of the Golborne accident, and they confirmed this to the Safety and Health Commission on 17 November 1981.

The study on "Preventative measures to be taken against instantaneous outbursts of methane and coal or rock", which received financial assistance from the Commission of the European Communities, was completed on time and will be submitted to the Safety and Health Commission and its Working Parties on Ventilation, Firedamp and Other mine Gases and on Strata Control and Stability of Ground in order that practical conclusions may be drawn from it.

The Working Party was instructed by the Safety and Health Commission, following a number of firedamp ignitions, to study the combinations of materials suitable for the impellers and housings of auxiliary fans, in order to reduce the hazard of sparks being produced by friction between the constituent parts.

The types of materials used in the United Kingdom were subjected in 1979 to tests developed by the Explosion and Flame Laboratory of the Health and Safety Executive (SMRE). During these tests, combinations of materials were found which do not ignite firedamp under test conditions. These tests involved a rotating disc rubbing against a slider.

The Working Party felt that these tests were especially well suited to the aim sought and expressed the wish that they might receive financial assistance under the ECSC Safety in Mines research programme. A set of five combinations of materials was selected.

The proposal for these tests from the Safety and Health Commission was accepted by the Commission of the European Communities and financial assistance was approved at the end of 1981. It will therefore be possible to carry out the tests at the beginning of 1982.

At the instigation of a Committee of Experts, the Working Party will undertake the "Examination of the special requirements for workings with auxiliary ventilation in which dust control and air conditioning equipment is used". This also involves the "Examination of controlled partial recirculation of air in drivages".

In order to lend weight item B6 of the Working Party's terms of reference, it was decided that it should give priority to the study of "Heavy gas emissions". The aim here is to study the circumstances under which there are sudden influxes of large quantities of gas.

CHAPTER I

MECHANIZATION

The Working Party on Mechanization held two full meetings on 9 and 10 June 1981 in Ibbenbüren and Gelsenkirchen and on 29 October 1981 in Luxembourg.

Preparation of the document on "Safety techniques in the operation of belt conveyors" has been held up somewhat as a result of difficulty in keeping pace with technical advances. It will be submitted to the Safety and Health Commission in 1982.

As it stands, this document makes up the second part of a whole consisting of:

- safety techniques in the winning area*)
- safety techniques for belt conveyors.

Examination has started on the third section relating to safety techniques applied to locomotives.

In 1981, work began on a new topic: safety techniques for transport of heavy loads.

The Working Party's field trip to the Federal Republic of Germany enabled it to visit two mines:

- Hugo Colliery,Gelsenkirchen, 9 June 1981

  The workings visited were in the Zollverein seam at a depth of 1 024 metres. The main points noted were strata and coal reinforcement with polyurethane, pneumatic stowing and mechanized gate road drivage.

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*) Doc. 3068/75 - 15th Report of the Safety and Health Commission (Year 1977).

- Ibbenbüren Colliery, 10 June 1981

The district visited was situated in seam 54 at a depth of 1350 metres. The main point of relevance to the Working Party's activities was the use of twin-stand large-capacity belt conveyors for coal transport and manriding.

Interesting techniques were also noted in the fields of gas drainage and support (backfilling of gaps behind the supports with anhydrite, roadway floor bolting).

CHAPTER J

STRATA CONTROL AND STABILITY OF GROUND

The Working Party met twice, on 13 February 1981 in Luxembourg and on 6 and 7 October in Grosseto (Italy).

At the first meeting, the Working Party completed examination of the document on 'Minimum safety considerations to be taken into account when constructing, maintaining or removing tips and lagoons of any materials extracted from mines or quarries' (Doc. 2484/7/80).

This document was adopted by the Safety and Health Commission on 3 April 1981. The presence of tips or lagoons and deposits of materials related to the extractive industries has already led to a number of accidents in the Member States. The above rules relate to all such industries and not just to collieries.

The Working Party also made progress in preparing a document on the drivage of in-seam headings and of gateroads for longwall faces.

This document will be submitted to the Safety and Health Commission in 1982.

As a result of the Ibbenbüren accident, the Working Party will be required to study, in cooperation with the Working Party on Ventilation, Firedamp and Other Mine Gases, the prevention of accidents due to rockbursts or instantaneous gas outbursts.

Because of the rapid increase in mine depth, and the great depths already attained in certain collieries, it is essential to give high priority to the investigation of such phenomena and to compare the experience already acquired in the field.

A large number of measurement techniques or early detection systems have been put forward whose range of action has yet to be clearly specified. This field of study offers a great deal of scope for research.

Documentation on the operational characteristics of the zinc and lead mine at Tara (Tara Mines Limited, Navan, Ireland) was supplied to the Working Party.

In addition, the Working Party visited the pyrites mines at Grosseto (Italy).

The Working Party intends to devote a large proportion of its time in 1982 to the study of the special problems of ore mines.

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N.B. The English, French and German versions of a study carried out with the financial assistance of the Commission of the European Communities on "Methods of identifying and measuring tectonic stress concentrations in deep-level mines liable to rockbursts" - (Bergbau - Forschung GmbH - Essen) are now available.

CHAPTER K

OIL, GAS AND OTHER MATERIALS EXTRACTED BY BOREHOLE

Two meetings of the Working Party were held on 12 May and 29 September 1981.
The May meeting was devoted to the preparation of the following documents:

- Proposal to the governments for well documentation (offshore wells) (Doc. 3578/5/79);
- Proposal to the governments for guidelines for procedures relating to rescue, evacuation and emergencies at offshore installations (offshore drilling, production and accomodation installations) (Doc. No 2523/5/79);
- Proposal to the governments for a method of presenting statistics of accidents resulting from the exploration for and exploitation of minerals by borehole (offshore) (Doc. No 2897/4/81).

At the September meeting, preparation was completed of a proposal to the governments requesting the reporting of dangerous occurrences arising from the exploration for and exploitation of oil, gas and other materials extracted by borehole (Doc. No 4276/1/81).

All these documents were adopted by the Safety and Health Commission at its meeting on 17 November 1981.

The proposal on offshore well documentation was drawn up in order to provide all the information required for the trouble-shooting teams to take decisions on such installations. This is the last in a series of documents specifically related to blowout control.

The second proposal covers a range of reasoned measures, to be planned and periodically drawn to the attention of the work-force, for all accidents, whether they involve a person falling overboard or the evacuation of an installation.

The third proposal concerns accident statistics. In addition to the fact that this is one of the tasks conferred on the Safety and Health Commission (Articles 1 and 8 of the terms of reference), the large number of workers engaged in European waters in propecting for and exploiting oil and gas fully justifies efforts to draw up Community statistics. The main aim of such statistics is naturally to provide an objective basis for determining accident prevention strategy.

It proved no easy task to collate existing national statistical data. This was because of a disparity arising from the differing statistical systems adopted by certain countries. The majority record the seriousness of the accident by noting the number of days of absence before work is resumed, and the rest assess seriousness on the basis of a medical opinion.

The users of the statistics which in future will be compiled at Community level must be aware of this disparity. Fatal accidents are naturally recorded in the same way by all countries.

From a theoretical standpoint, there are reasons for regretting this way of solving the problem of common statistics, but it seemed preferable to start compiling statistical series in this manner rather than to postpone presentation of statistics indefinitely in an effort to solve the difficult problem of combinning techniques which have their own logic.

In future, and in cooperation with the Working Party on Common Accident Statistics, an attempt will be made to find a conversion factor in order to standardize data. A system of this type has been applied since 1977 for common statistics of accidents in coal mines.

In the interim, the data make it possible to observe the relative change in the statistics for the various countries.

The Safety and Health Commission's action is mainly based on exchanges of views between those responsible for safety in the various branches of the extractive industries and it is a fact that correct and logical analysis of the accidents occurring is a vital data source. Since its inception, the Safety and Health Commission has always examined very carefully the circumstances surrounding serious accidents occurring in coal mines in order to glean the necessary information from them. If need be, it has used them as a source of remits for the Working Parties.

The fourth document referred to above pursues the same aim for the oil and gas industries.

The Secretary of the Safety and Health Commission has received, courtesy of the Norwegian Government, a copy of the full report on the accident which occurred on the Alexander Kielland platform. The Norwegian Government has asked for our observations on this report. In reply, the Secretariat sent it the set of documents drawn up by the Safety and Health Commission to date on prospecting and production operations and the one document relating to platform evacuation.

The Safety and Health Commission was apprized of and approved the programme of the Working Party on Oil and Gas, which is intended to provide a clear planning framework along the lines of the broad remit of the Working Party. It is in particular the intention of the Working Party to study safety problems relating to onshore installations.

Prior notice is also given that an international symposium is planned for Spring 1983 on the broad theme of safety and health in the oil and gas extracting industries. An outline programme has already been drawn up. One of the six topics selected is safety training.

CHAPTER L

COMMITTEE OF EXPERTS ON THE USE OF DIESEL ENGINES IN THE EXTRACTIVE INDUSTRIES

This Committee of Experts was set up by a decision of the Safety and Health Commission on 23 October 1980 as a practical follow-up to Mr Staehler's reports (Documents Nos 4706/76 and 4781/77). These extremely detailed reports contained a wide range of information on the health, explosion and fire hazards associated with the use of diesel engines underground.

The Committee of Experts held two meetings on 26 February and 23 November 1981.

During the first meeting, the plan of work was drawn up and it was decided that a start should be made to studying the engine itself and its auxiliaries.

This study will be concerned with all underground workings, but not the oil or gas extracting industries, which normally use techniques of a quite different nature.

Three select committees were set up in order to study the three aspects of the problem mentioned above, and two of them have almost completed their work, i.e. the two dealing with the health and axplosion hazards.

The Staehler reports have also been updated with information obtained from questionnaires sent to the coal and other mining industries. The answers to these questionnaires showed that there was a large measure of agreement on the objectives to be attained when installing engines underground. For example, agreement was reached on the admissible concentrations of the main gaseous pollutants emitted by diesel engines. However,

the same was not true for the concentrations of emitted particulate matter in the ventilating air.

The select committee set up to investigate the fire hazard will begin its work early in 1982. It may thus be expected that the Committee of Experts as a whole will be able to submit its conclusions to the Safety and Health Commission by the end of 1982.

This will mark the end of the clearly defined mission with which the Committee was entrusted.

It supplemented its work by proposing research and development topics which take account of the increasing trend towards the use of diesel engines in underground workings. It was decided that its remit should not be extended to cover harmonization of the approval requirements for diesel engines with respect to flameproofing. This is of course a topic of great interest, but because of the differences in existing approval procedures it seems likely to require an amount of work and a range of resources which exceed the capacity of the Secretariat of the Safety and Health Commission, given the other tasks it has to perform.

SECTION III

COMMON ACCIDENT STATISTICS

SECTION III

COMMON ACCIDENT STATISTICS

1. Tables

1.1. At the end of this chapter there are the following tables :

- 1a and 1b

  Victims of accidents by cause, location and period of incapacity in absolute figures (a) and frequency rates (b).
  These tables cover 1981 for each country and for the Community. They can be obtained from the Secretariat and are broken down by coalfield.

- 2a

  Tables 2a are available for each country but as the assesment of incapacity periods was not standardized, they do not permit data to be prepared for the Community of the IX.
  The breakdown of the accidents will need to be revised in the future in accordance with the incapacity period.

- A and B

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

- C

  Group accidents for the Community by cause.

- D

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

1.2. The development can be analyzed for all categories of accidents for the Community of Nine over the last five years. Nevertheless, some tables still refer to the Community of the Six to allow the long-term development since 1958 or 1971 to be observed.

2. Examination of the accident statistics from 1977 to 1981 (Community of the Nine)

2.1. Development in the frequency rates.

Year	Inoapacity period 4 to 20 d.	21 to 51 d.	56 d.	fatalities	total
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
1981	82,15	32,64	10,54	0,194	125,52

As indicated in paragraph 1.1.2, the trend between 1980 and 1981 is favourable and significant for fatalities and all categories of injuries with the exception of those incapacitating the victims for more than 56 days.

The general trend over the last 5 years is favourable despite fluctuations for serious injuries and a negative trend for fatalities up to 1980, followed by a considerable drop.

2.2. Development in absolute figures.

The total number of accidents causing more than 3 days incapacity has dropped from 74 102 to 70 534 from 1980 to 1981 for a slightly lower number of working hours.

From 1977 to 1981 the number of accident victims decreased by 17 524 (88 058 in 1977 compared with 70 534 in 1981) or 19.9%, whilst the number of hours decreased by only 2.71% (577 590 360 in 1977 compared with 561 939 272 in 1981)

3. Distribution of accidents in 1981 in accordance with incapacity periods.

	absolute figure	share
- 4 to 20 days incapacity	46.160	65,46%
- 21 to 56 days "	18.336	26,00%
- more than 56 days "	5.922	8,40%
- fatalities	109	0,14%
Total	70.534	100,00%

For serious injuries, there was a slight increase in 1981, but for all other groups there was decrease over the 4 preceding years

4. BREADKOWN OF ACCIDENTS BY MAIN CAUSES AND BY SERIOUSNESS

(Headings I to V of tables 1)

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

Incapacity / Causes	4 to 20 days %	21 to 56 days %	>56 days %	fatalities %	Total %
I. Falls of ground.....	20,90 ↑	18,8 =	19,4 ↑	19,3 ↓	20,2 ↑
II. Transport....	8,30 ↓	9,2 ↓	14,8 ↓	43,1 ↑	9,1 ↓
III.Slipping,falling & stumbling	27,90 ↑	32,9 ↑	30,1 ↑	13,8 ↑	29,3 ↑
IV.Machinery, tools etc.....	17,30 ↑	16,4 ↑	13,9 ↑	2,7 ↓	16,8 ↑
V.Falling objects	17,10 ↑	16,3 ↓	17,5 ↓	5,5 ↓	16,9 ↓
TOTAL...	91,40 ↑	93,6 ↑	95,7 ↑	84,4 ↓	92,3 ↑

Changes compared with 1980 :
Key :

No change: =
Increase : ↑
Decrease : ↓

4.2. Conclusions to be drawn from the table in 4.1.

4.2.1. Overall these causes of accidents represent approximately 90% of all causes (a slight increase) for this year and last year. The size of the share of these five headings increases with the gravity of the accident (from 91.4% for incapacity of between 4 and 20 days, to 95.7% for incapacity of more than 56 days). The figures on fatalities, which are too arbitrary from a statistical point of view, do not lend themselves to comparison.

4.2.2. When the fluctuations in the distribution of causes of all accidents from 1979 to 1980 are compared the following trend emerges:

-falls of ground after a decrease in 1980, figures increased again to the level of 1979

-transport: constant decrease

-slipping etc: constant and fairly large increase

-machinery, tools etc: constant, fairly large increase

-falling objects: almost constant.

5. Chronological development since 1977.

To avoid conclusions which are erroneous or out-of date, the chronological comparison is restricted to 1977 to 1980 for which comparable figures are available for the Community of the Nine.

5.1. Development in the frequency rates for the most important causes of accidents and for all causes.

5.1.1. Accidents in all incapacity categories and fatalities.

Causes \ Year	1977	1978	1979	1980	1981
I. Falls of ground.....	31,66	31,15	28,29	25,99	25,38
II. Transport.....	15,74	15,51	14,21	13,18	11,42
III. Slipping etc.....	40,09	41,52	39,27	37,37	36,84
IV. Equipment, tools etc.	25,40	23,63	21,65	20,98	21,04
V. Falling objects.....	25,60	25,33	23,53	22,38	21,20
Total causes.....	152,46	150,82	139,26	131,22	125,52

5.1.2. Development in the frequency rates for the most important causes of accidents and for all causes (accidents resulting in incapacity for 4 to 20 days)

Causes \ Year	1977	1978	1979	1980	1981
I. Falls of ground.....	21,79	21,02	19,22	17,65	17,17
II. Transport.....	9,34	9,37	8,72	8,08	6,79
III. Slipping etc.....	25,15	26,15	24,66	23,58	22,90
IV. Equipment, tools etc.	16,92	15,95	14,82	14,57	14,20
V. Falling objects.....	16,53	16,56	15,19	14,70	14,02
Total causes	99,60	98,97	91,62	87,02	82,15

5.1.3. Development in the frequency rates for the most important causes of accidents and for all causes (accidents resulting in incapacity for 21 to 56 days).

Causes \ Year	1977	1978	1979	1980	1981
I. Falls of ground.....	7,51	7,69	6,80	6,40	6,13
II. Transport	4,50	4,20	3,76	3,43	2,99
III. Slipping etc.....	11,86	12,23	11,61	10,93	10,74
IV. Equipment, tools etc..	6,79	6,04	5,42	5,10	5,37
V. Falling objects.....	7,14	6,73	6,40	5,88	5,32
Total causes	41,17	39,99	36,65	34,07	32,64

5.1.4. Development in the frequency rates of the most important causes of accidents and for all causes (accidents resulting in incapacity for over 56 days).

Causes \ Year	1977	1978	1979	1980	1981
I. Falls of ground.....	2,31	2,36	2,23	1,87	2,04
II. Transport.....	1,82	1,83	1,65	1,57	1,56
III. Slipping etc.....	3,05	3,12	2,96	2,83	3,17
IV. Equipment, tools etc..	1,67	1,62	1,40	1,29	1,46
V. Falling objects.....	1,93	2,04	1,98	1,78	1,85
Total causes	11,49	11,62	10,76	9,89	10,54

5.2. General conclusions

5.2.1. The development in accident rates underground in the Community's Coal Mines is, in general, positive over the years between 1977 and 1981, for which comparable figures are available for the Community of the Nine, which a constant decrease in the rates for all accidents recorded statistically (accidents causing more than four days of incapacity and fatalities).

This also applies to the rate for accidents causing between four and twenty days and twenty-one and fifty-one days of incapacity.

For the rate of serious accidents (more than 56 days incapacity the trend is favourable over the five years but the decrease is not appreciable.

The trend for the rate of fatal accidents was negative up to 1980 but there was a sizeable drop in 1981 with a rate below that of 1977 (see table under 2.1.).

5.2.2. The table in 5.1.1. reveals a favourable trend in the frequency rates for the most important causes of accidents and for all causes.

5.2.3. The development of the frequency rates for accidents resulting in incapacity for 4 to 20 days for the most important causes of accidents and for all causes (cf. the table in 5.1.2.) is favourable for all causes from 1979 on following an increase or stagnation in the rates for some causes of accidents.

5.2.4. The trend in the frequency rates for accidents resulting in incapacity for 21 to 56 days (cf. the table in 5.1.3.) is favourable for all causes from 1979 on, following an increase in the rates for some causes of accidents in 1978.

The sole exception is an increase in the rate for Cause IV 'Equipment, tools etc.' in 1981 which, however, is still below the relatively low level of 1979.

5.2.5. The trend in the frequency rates for accidents resulting in incapacity for over 56 days (cf. the table in 5.1.4.) may also be considered positive. Even the rates for 1981, which indicate an increase over 1980 for all causes, except for 'transport', remain well below the rates for 1977 and 1978, with the sole exception of the rates cause III 'Slipping etc.' which show a varying trend, and one which is unfavourable over the long term.

5.2.6. The trend in the frequency rates for all categories of seriousness and for all important causes of accidents is favourable in almost every case. This confirms the statements based on the overall figures given in 2.1, 5.2.1. and 5.2.2.

COMMUNITY OF THE IX

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

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

(absolute figures)

Table 1a

YEAR 1981

COUNTRY: COMMUNITY OF IX

MAN-HOURS WORKED (1) 561 939 272

SITE OF THE ACCIDENT / CAUSES OF ACCIDENTS / Period of incapacity	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 (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total
I. FALLS OF GROUNDS AND ROCKS	5 405	1 958	636	9	8 008	3 084	1 076	396	11	4 567	42	8	5	0	55	1 118	403	111	1	1 633	9 649	3 445	1 148	21	14 263			
II. TRANSPORT, TOTAL	810	389	215	8	1 422	487	167	112	2	768	100	69	38	1	208	2 417	1 056	513	36	4 022	3 814	1 681	878	47	6 420			
a) Continuous Transport	149	111	104	4	368	103	38	29	2	172	1	0	2	0	3	220	87	48	6	361	473	238	183	12	904			
b) Discontinuous Transport	661	278	111	4	1 054	384	129	86	0	598	99	69	36	1	205	2 197	969	465	30	3 661	3 341	1 445	695	35	5 516			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	3 388	1 828	504	0	5 670	2 587	1 256	362	1	4 206	238	138	43	5	424	6 704	2 814	873	9	10 400	12 867	6 036	1 728	15	20 700			
a) While moving about the mine	469	189	47	0	705	366	127	21	0	514	32	13	6	0	51	2 474	846	232	1	3 553	3 341	1 175	306	1	4 823			
b) In the course of other activities	2 869	1 639	457	0	4 956	2 221	1 129	341	1	3 692	206	125	37	5	373	4 230	1 968	641	8	6 847	9 526	4 861	1 476	14	15 877			
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	3 432	1 377	403	2	5 214	2 177	744	225	1	3 087	91	39	12	0	142	2 342	857	183	0	3 382	7 982	3 017	823	3	11 825			
a) Machines	471	203	115	1	790	276	129	63	1	469	10	10	8	0	28	271	125	45	0	441	1 028	467	231	2	1 728			
b) Tools	945	356	80	0	1 381	702	223	62	0	987	50	22	4	0	76	889	328	57	0	1 284	2 569	929	203	0	3 728			
c) Supports	2 016	818	208	1	3 043	1 139	392	100	0	1 631	319	7	0	0	38	1 172	404	61	0	1 657	4 358	1 621	389	1	6 369			
V. FALLS OF OBJECTS	3 137	1 295	425	1	4 858	2 067	684	236	1	2 952	174	59	30	1	264	2 500	989	346	3	3 838	7 878	2 991	1 037	6	11 912			
VI. EXPLOSIVES	30	6	0	0	36	10	0	0	0	10	0	0	0	0	0	19	8	1	0	28	59	14	1	0	74			
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1			
VIII. OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO_2, CH_4, CO, H_2S), TOTAL	3	0	0	0	3	10	3	0	9	22	0	0	0	0	0	6	2	0	0	8	19	5	0	9	33		6	
a) Outbursts of Gas	0	0	0	0	0	7	3	0	9	19	0	0	0	0	0	2	0	0	0	2	9	3	0	9	21		8	
b) De-oxygenation and Poisoning by natural Gases	3	0	0	0	3	3	0	0	0	3	0	0	0	0	0	4	2	0	0	6	10	2	0	0	12		0	
IX. HEATINGS OR FIRES	3	1	0	0	4	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	5	1	0	0	6			
X. INRUSHES	2	1	0	0	3	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1	4	1	0	0	5			
XI. ELECTRICITY	2	1	0	0	3	4	1	1	0	6	3	1	0	0	4	21	7	2	0	30	30	10	3	0	43			
XII. OTHER CAUSES	858	253	75	0	1 186	592	146	24	8	770	45	11	1	0	57	2 361	728	150	0	3 239	3 856	1 138	250	8	5 252			
TOTAL	17 210	7 109	2 258	20	26 408	10 958	4 041	1 356	33	16 381	694	325	129	7	1 155	17 491	6 864	2 179	49	26 583	46 164	18 339	5 922	109	70 534		8	

(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).

(3) Calendar days.

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SAFETY AND HEALTH COMMISSION
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Common Statistics on victims
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DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE OF ACCIDENT AND PERIOD OF INCAPACITY

(frequency rates)

Table 1b

COUNTRY: COMMUNITY OF IX

YEAR 1981

MAN-HOURS WORKED (1) 561 939 272

SITE OF THE ACCIDENT / CAUSES OF ACCIDENTS / Period of incapacity	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and stapla-pits 3					Other places 4					Total of accidents underground 5					Group accidents (2) 6		
	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	> 56 days (3)	Fatal acci-dents	total
I. FALLS OF GROUNDS AND ROCKS	9,62	3,48	1,13	0,02	14,25	5,49	1,91	0,70	0,02	8,13	0,07	0,01	0,01	–	0,10	1,99	0,72	0,20	0,00	2,91	17,17	6,13	2,04	0,04	25,38			
II. TRANSPORT, TOTAL	1,44	0,69	0,38	0,01	2,53	0,87	0,30	0,20	0,00	1,37	0,18	0,12	0,07	0,00	0,37	4,30	1,88	0,91	0,06	7,16	6,79	2,99	1,56	0,08	11,42			
a) Continuous Transport	0,27	0,20	0,19	0,01	0,65	0,18	0,07	0,05	0,00	0,31	0,00	–	0,00	–	0,01	0,39	0,15	0,09	0,01	0,64	0,84	0,42	0,33	0,02	1,81			
b) Discontinuous Transport	1,18	0,49	0,20	0,01	1,88	0,68	0,23	0,15	–	1,06	0,18	0,12	0,06	0,00	0,36	3,91	1,72	0,83	0,05	6,51	5,95	2,57	1,24	0,06	9,82			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	5,94	3,25	0,90	–	10,09	4,60	2,24	0,64	0,00	7,48	0,42	0,25	0,08	0,01	0,75	11,93	5,01	1,55	0,02	18,51	22,90	10,74	3,17	0,03	36,84			
a) While moving about the mine	0,83	0,34	0,08	–	1,25	0,65	0,23	0,04	–	0,91	0,06	0,02	0,01	–	0,09	4,40	1,51	0,41	0,00	6,32	5,95	2,09	0,54	0,00	8,58			
b) In the course of other activities	5,11	2,92	0,81	–	8,84	3,95	2,01	0,61	0,00	6,57	0,37	0,22	0,07	0,01	0,66	7,53	3,50	1,14	0,01	12,18	16,95	8,65	2,63	0,02	28,25			
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	6,11	2,45	0,72	0,00	9,28	3,77	1,32	0,40	0,00	5,49	0,16	0,07	0,02	–	0,25	4,17	1,53	0,33	–	6,02	14,20	5,37	1,46	0,01	21,04			
a) Machines	0,84	0,36	0,20	0,00	1,41	0,49	0,23	0,11	0,00	0,83	0,02	0,02	0,01	–	0,05	0,48	0,22	0,08	–	0,78	1,83	0,83	0,41	0,00	3,08			
b) Tools	1,68	0,63	0,14	–	2,46	1,25	0,40	0,11	–	1,76	0,09	0,04	0,01	–	0,14	1,60	0,58	0,10	–	2,28	4,62	1,65	0,36	–	6,63			
c) Supports	3,59	1,46	0,37	0,00	5,42	2,03	0,70	0,18	–	2,90	0,06	0,01	–	–	0,07	2,09	0,72	0,14	–	2,95	7,76	2,88	0,69	0,00	11,33			
V. FALLS OF OBJECTS	5,58	2,30	0,76	0,00	8,65	3,68	1,15	0,42	0,00	5,25	0,31	0,10	0,05	0,00	0,47	4,45	1,76	0,62	0,01	8,83	14,02	5,32	1,85	0,01	21,20			
VI. EXPLOSIVES	0,05	0,01	–	–	0,06	0,02	–	–	–	0,02	–	–	–	–	–	0,03	0,01	0,00	–	0,05	0,10	0,02	0,00	–	0,13			
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	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_2S), TOTAL	0,01	–	–	–	0,01	0,02	0,01	–	0,02	0,04	–	–	–	–	–	0,01	0,00	–	–	0,01	0,03	0,01	–	0,02	0,06		0,01	
a) Outbursts of Gas	–	–	–	–	–	0,01	0,01	–	0,02	0,03	–	–	–	–	–	0,00	–	–	–	0,00	0,02	0,01	–	0,02	0,04		0,01	
b) De-oxygenation and Poisoning by natural Gases	0,01	–	–	–	0,01	0,01	–	–	–	0,01	–	–	–	–	–	0,01	0,00	–	–	0,01	0,02	0,00	–	–	0,02			
IX. HEATINGS OR FIRES	0,01	0,00	–	–	0,01	–	–	–	–	–	–	–	–	–	–	0,00	–	–	–	0,00	0,01	0,00	–	–	0,01			
X. INRUSHES	0,00	0,00	–	–	0,01	–	–	–	–	–	0,00	–	–	–	0,00	0,00	–	–	–	0,00	0,01	0,00	–	–	0,01			
XI. ELECTRICITY	0,00	0,00	–	–	0,01	0,01	0,00	0,00	–	0,01	0,01	0,00	–	–	0,01	0,04	0,01	0,00	–	0,05	0,05	0,02	0,01	–	0,08			
XII. OTHER CAUSES	1,53	0,45	0,13	–	2,11	1,05	0,26	0,04	0,01	1,37	0,08	0,02	0,00	–	0,10	4,20	1,30	0,27	–	5,76	6,88	2,03	0,44	0,01	9,35			
TOTAL	30,29	12,65	4,02	0,04	46,99	19,50	7,19	2,41	0,06	29,15	1,24	0,58	0,23	0,01	2,06	31,13	12,21	3,88	0,09	47,31	82,15	32,64	10,54	0,19	125,52		0,01	

(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).
(3) Calendar days.

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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 limb, 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 suport or one of its components falls during transport, the accident should be included in category V "Falls of objects".

(ategory 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 frams, 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 or firedamp or dust, it should always be included in category VII.

VIII. Outbursts of gas - Deoxygenation, suffocation or poisoning by natural gases (CO_2, CH_4, CO, H_2S)

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 (CO_2, CH_4 ,CO, H_2S)

This includes accidents caused by lack of oxygen, by suffocation (CH_4, CO_2) and by poisoning (CO, H_2S). 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 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 curring 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 VI
Years 1977 to 1981 : Community of Nine

COMMUNITY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1) Falls of ground	4,846	4,490	4,571	4,434	4,387	4,337	4,509	4,215	4,186	4,060	4,261	4,492	4,135	4,109	4,08	4,29
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
3) Movement of personnel	2,003	1,823	2,185	2,185	2,282	2,261	2,326	2,364	2,320	2,354	2,795	3,023	3,084	3,117	3,47	3,88
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
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
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	-
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	-	-	-	-	-	-
9) Fires & spontaneous combustion	-	-	0,002	0,001	-	-	-	0,002	-	-	0,002	-	-	-	-	0,003
10) Inrushes	0,002	-	-	-	0,001	0,002	0,003	-	0,001	-	0,002	-	0,009	0,002	0,003	0,009
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
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
TOTAL	13,550	12,955	12,987	13,226	13,778	13,762	13,858	13,506	13,242	13,243	14,370	15,060	15,047	15,088	15,599	16,798

COMMUNITY	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	4,15	3,61	3,48	2,31	2,36	2,23	1,87	2,04								
2) Transport	1,91	2,28	2,14	1,82	1,83	1,65	1,57	1,56								
3) Movement of personnel	3,89	3,38	3,62	3,05	3,12	2,96	2,83	3,17								
4) Machinery, handling of tolls & support	1,98	2,29	2,15	1,67	1,62	1,40	1,29	1,46								
5) Falling objects	3,62	3,08	3,08	1,93	2,04	1,98	1,78	1,85								
6) Explosives	0,01	0,006	0,01	0,01	0,01	0,01	0,00	0,00								
7) Explosions of firedamp and dust	0,02	-	-	-	0,01	0,00	0,03	-								
8) Gas outbursts, suffocation by natural gases	-	0,003	0,003	-	0,01	-	-	-								
9) Fires & spontaneous combustion	0,01	0,003	-	-	-	-	-	-								
10) Inrushes	-	-	0,01	-	-	-	0,00	-								
11) Electricity	0,01	0,16	-	-	0,01	0,01	0,00	0,01								
12) Other causes	0,53	0,37	0,40	0,70	0,62	0,51	0,50	0,44								
TOTAL	16,13	15,182	14,893	11,49	11,63	10,75	9,87	10,53								

B. COMPARATIVE TABLE OF UNDERGROUND FATALITIES

FREQUENCY RATES

Years 1958 to 1976 : Community of Six

Years 1977 to 1981 : Community of Nine

COMMUNITY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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	0,135	0,133	0,092	0,13
2) Transport	0,147	0,141	0,146	0,168	0,124	0,167	0,178	0,149	0,160	0,128	0,115	0,145	0,132	0,104	0,141	0,12
3) Movement of personnel	0,057	0,063	0,047	0,056	0,045	0,060	0,045	0,051	0,060	0,044	0,054	0,038	0,039	0,043	0,043	0,04
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
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
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	-	-
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	-	-
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
9) Fires & spontaneous combustion	-	0,003	-	0,001	-	0,003	0,005	0,005	-	-	-	-	-	-	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
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
TOTAL	0,610	0,590	0,506	0,546	0,931	0,547	0,492	0,522	0,536	0,459	0,460	0,438	0,428	0,440	0,399	0,408

COMMUNITY	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	0,11	0,10	0,07	0,05	0,08	0,04	0,07	0,04								
2) Transport	0,08	0,11	0,09	0,08	0,11	0,08	0,10	0,08								
3) Movement of personnel	0,05	0,047	0,06	0,02	0,02	0,03	0,03	0,03								
4) Machinery, handling of tolls and supports	0,02	0,047	0,05	0,02	0,02	0,01	0,02	0,01								
5) Falling objects	0,04	0,038	0,04	0,01	0,01	0,02	0,02	0,01								
6) Explosives	-	-	0,006	0,01	0,00	0	-	-								
7) Explosions of firedamp and dust	0,13	-	0,06	-	-	0,03	0,00	-								
8) Gas outbursts, suffocation by natural gases	-	-	0,006	-	-	-	-	0,02								
9) Fires & spontaneous combustion	-	-	-	0,01	-	-	-	-								
10) Inrushes	-	-	-	-	-	-	-	-								
11) Electricity	-	-	0,003	-	-	-	0,01	-								
12) Other causes	0,02	0,003	0,02	0,01	-	0,01	0,01	0,01								
TOTAL	0,45	0,345	0,405	0,21	0,24	0,22	0,26	0,20								

C. COMPARATIVE TABLE OF UNDERGROUND GROUP ACCIDENTS (1) FOR THE COMMUNITY OF SIX

ANNEES 1960 to 1981

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	Gasoutbursts, 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 explosions	16	2
1981	1	Gas outbursts of firedamp	7	8

(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	12,986
1961	235 848	245	962	527	12 720	2,235	53,93	0,548	13,227
1962	233 233	259	901	840 (3)	12 418	3,602 (3)	53,24	0,932(3)	13,781
				541 (4)		2,320 (4)		0,600(4)	
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. UNITED KINGDOM

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 NINE

Years 1976 - 1981

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
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
1981	245 652	434	562	109	5 922	0,444	24,11	0,194	10,54

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

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
4-20 days -actual....	47 203	40 376	37 384	34 797	33 985	30 643	29 466	27 602	26 325	26 693	27 864	
Frequency rate.....	113,96	109,31	112,77	110,97	106,67	101,77	103,90	102,15	99,86	100,87	101,66	
Increase/decrease on previous year..... %	-	- 4	+ 3,17	- 1,6	- 3,9	-4,8	+ 2,1	- 1,7	- 2,2	+ 1,0	+ 4,2	
21 - 56 days-actual	21 116	18 531	17 325	15 875	15 454	13 923	13 388	13 240	12 779	12 820	12 719	
Frequency rate.....	50,98	50,17	52,26	50,62	48,50	46,24	47,21	49,00	47,95	48,45	46,41	
Increase/decrease on previous year..... %	-	-1,59	+ 4,17	- 3	- 4,2	- 4,8	+ 2,1	+ 3,7	-2,1	+ 1,1	- 4,4	
More than 56 days-act.	6 249	5 763	5 560	5 054	4 795	4 791	4 357	4 443	4 380	4 108	4 520	
Frequency rate.....	15,09	15,60	16,77	16,12	15,05	14,92	15,36	16,44	16,43	15,52	16,49	
Increase/decrease on previous year.... %	-	+3,4	+7	- 4	- 6,7	- 0,8	+ 2,9	+ 6,6	-0,06	- 5,9	+ 9,1	
Fatalities total-act.	182	147	137	143	110	125	83	95	91	103	84	
Frequency rate.....	0,440	0,399	0,413	0,456	0,345	0,415	0,293	0,352	0,341	0,389	0,306	
Increase/decrease on previous year.... %	-	- 10	+3,9	+10,4	- 24	+ 20	-29,4	+ 20,1	- 4,2	+14,1	-18,4	
Actual without accident.....	162	141	128	96	110	109	66	95	81	101	76	
Frequency rate.....	0,391	0,382	0,385	0,307	0,345	0,362	0,233	0,352	0,304	0,382	0,277	
Increase/decrease on previous year.... %	-	-2,3	+ 1	-21	+ 12	+4,9	-39,4	+51,1	-13,6	+25,7	-24,7	

GERMANY

A. COMPARATIVE TABLE OF THE NUMBER OF PERSONS INCAPACITATED BY ACCIDENTS FOR LONGER THAN 56 DAYS

FREQUENCY RATES

Years 1958 to 1981

GERMANY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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
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
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) Machinery, handling of tolls 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
5) Falling objecta	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
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	-	-	-
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	-	-
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
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
TOTAL	13,721	14,007	13,819	14,109	14,539	14,498	14,999	15,133	14,598	14,599	15,540	16,096	15,798	14,886	15,33	16,175

GERMANY	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	4,08	3,69	3,47	3,67	3,48	3,51	2,99	3,15								
2) Haulage and transport	1,68	2,16	1,89	1,74	1,77	1,71	1,72	1,62								
3) Movement of personnel	4,15	3,37	3,58	4,09	4,17	4,63	4,49	5,09								
4) Machinery, handling of tools and supports	1,58	2,16	1,85	2,09	1,90	1,85	1,67	1,78								
5) Falling objects	3,37	2,97	2,92	3,03	3,34	3,54	3,38	3,35								
6) Explosives	0,01	-	0,01	-	-	0,01	0,00	0,00								
7) Explosions of firedamp or coal dust	-	-	0,02	-	-	0,01	0,08	-								
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-	-	-	-	-	-								
9) Underground combustion and fires	-	-	-	-	-	-	-	-								
10) Inrushes of water	-	-	-	-	-	-	0,00	-								
11) Electricity	-	0,009	0,01	0,01	0,01	0,07	0,01	0,01								
12) Other causes	0,52	0,32	0,40	0,36	0,20	0,56	0,13	0,16								
TOTAL	15,39	14,679	14,15	14,99	14,87	15,89	14,47	15,16								

B. COMPARATIVE TABLE OF UNDERGROUND FATALITIES

FREQUENCY RATES

Yerars 1958 to 1981

GERMANY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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
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
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
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
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
6) Explosives	0,009	0,003	0,003	-	0,004	0,000	0,002	-	-	-	0,004	-	-	-	-	-
7) Explosions of firedamp or coal dusts	0,011	0,012	-	-	0,660	0,002	0,002	0,019	0,056	-	0,061	-	-	0,008	-	-
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
9) Underground combustion and fires	-	0,003	0,000	0,002	-	0,006	0,009	0,005	-	-	-	-	-	-	-	-
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	0,000	0,003	0,004	0,004	0,004	0,000	0,004	0,005
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
TOTAL	0,688	0,681	0,611	0,650	1,322	0,657	0,687	0,582	0,629	0,542	0,509	0,504	0,408	0,460	0,458	0,410

GERMANY	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) falls of ground	0,12	0,12	0,06	0,07	0,13	0,08	0,09	0,05								
2) Haulage and transport	0,07	0,12	0,10	0,09	0,14	0,11	0,13	0,13								
3) Movement of personnel	0,06	0,06	0,07	0,05	0,05	0,07	0,05	0,04								
4) Machinery, handling of tolls ands supports	0,02	0,05	0,03	0,04	0,04	0,03	0,04	-								
5) Falling objects	0,04	0,05	0,05	0,02	0,03	0,05	0,05	0,02								
6) Explosives	-	-	0,005	-	-	-	-	-								
7) Explosions of firedamp or coal dust	-	-	0,01	-	-	0,04	0,01	-								
8) Sudden outburts of firedamp, suffocation by natural gases	-	-	0,01	-	-	-	-	0,03								
9) Underground combustion and fires	-	-	-	0,04	-	-	-	-								
10) Inrushes of water	-	-	-	-	-	-	-	-								
11) Electricity	-	-	0,005	0,01	-	-	0,01	-								
12) Other causes	0,03	0,005	0,03	0,02	0,01	0,01	0,02	0,04								
TOTAL	0,34	0,405	0,370	0,34	0,40	0,39	0,40	0,31								

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

Table 1a

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

(absolute figures)

COUNTRY: GERMANY

YEAR 1981

MAN-HOURS WORKED (1) 201 427 516

SITE OF THE ACCIDENT / Period of incapacity / 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 (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total
I. FALLS OF GROUNDS AND ROCKS	1 324	799	318	3	2 444	1 313	657	268	7	2 245	11	5	4	–	20	253	131	44	1	429	2 901	1 592	634	11	5 138	–	–	–
II. TRANSPORT, TOTAL	124	129	94	6	353	79	44	41	1	165	14	23	17	1	55	228	220	175	19	642	445	416	327	27	1 215	–	–	–
a) Continuous Transport	37	42	59	3	141	19	12	16	1	48	–	–	2	–	2	18	21	22	4	65	74	75	99	8	256	–	–	–
b) Discontinuous Transport	87	87	35	3	212	60	32	25	–	117	14	23	15	1	53	210	199	153	15	577	371	341	228	19	959	–	–	–
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	1 747	1 147	349	–	3 243	1 300	825	266	1	2 392	132	98	32	3	263	1 516	1 013	378	5	2 912	4 695	3 081	1 025	9	8 810	–	–	–
a) While moving about the mine	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
b) In the course of other activities	1 747	1 147	349	–	3 243	1 300	825	268	1	2 392	132	96	32	3	263	1 516	1 013	378	5	2 912	4 695	3 081	1 025	9	8 810	–	–	–
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	727	504	173	–	1 404	597	363	125	1	1 086	23	23	7	–	53	345	235	53	–	630	1 692	1 125	358	1	3 176	–	–	–
a) Machines	138	95	54	–	287	96	65	32	1	194	3	6	5	–	14	80	69	26	–	175	317	235	117	1	670	–	–	–
b) Tools	308	154	30	–	492	285	136	35	–	458	18	16	2	–	36	217	121	16	–	354	828	427	83	–	1 338	–	–	–
c) Supports	281	255	89	–	625	216	162	58	–	438	2	1	–	–	3	48	45	11	–	104	547	463	158	–	1 168	–	–	–
V. FALLS OF OBJECTS	1 465	781	302	1	2 549	890	430	177	1	1 498	62	39	22	–	123	737	359	173	2	1 271	3 154	1 609	674	4	5 441	–	–	–
VI. EXPLOSIVES	–	–	–	–	–	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	–	–	–	1	–	–	–
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_2S), TOTAL	1	–	–	–	1	4	3	–	8	15	–	–	–	–	–	2	–	–	–	2	7	3	–	8	18	–	8	–
a) Outbursts of Gas	–	–	–	–	–	4	3	–	8	15	–	–	–	–	–	–	–	–	–	–	4	3	–	8	15	–	8	–
b) De-oxygenation and Poisoning by natural Gases	1	–	–	–	1	–	–	–	–	–	–	–	–	–	–	2	–	–	–	2	3	–	–	–	3	–	–	–
IX. HEATINGS OR FIRES	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
X. INRUSHES	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
XI. ELECTRICITY	–	1	–	–	1	3	–	1	–	4	–	–	–	–	–	11	5	1	–	17	14	6	2	–	22	–	–	–
XII. OTHER CAUSES	71	44	18	–	133	79	20	3	8	110	10	2	1	–	13	63	43	10	–	116	223	109	32	8	372	–	–	–
TOTAL	5 459	3 405	1 254	10	10 128	2 266	4 342	881	27	7 516	252	188	83	4	527	3 155	2 006	834	27	6 022	13 132	7 941	3 052	68	24 193	–	8	–

(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).

(3) Calendar days.

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SAFETY AND HEALTH COMMISSION
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Common Statistics on victims
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DETAILED BREAKDOWN OF ACCIDENT VICTIMS ACCORDING TO CAUSE AND SITE OF ACCIDENT AND PERIOD OF INCAPACITY

(frequency rates)

Table 1b

COUNTRY: GERMANY

YEAR 1981

MAN-HOURS WORKED (1) 201 427 516

SITE OF THE ACCIDENT	Production faces					Headings excluding shafts and staple-pits					Shafts and staple-pits					Other places					Total of accidents underground					Group accidents (2)		
	1					2					3					4					5					6		
Period of incapacity / CAUSES OF ACCIDENTS	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	> 56 days (3)	Fatal acci-dents	total
I. FALLS OF GROUNDS AND ROCKS	6,57	3,97	1,58	0,01	12,13	6,52	3,26	1,33	0,03	11,15	0,05	0,02	0,02	–	0,10	1,26	0,65	0,22	0,00	2,13	14,40	7,90	3,15	0,05	25,51	–	–	–
II. TRANSPORT, TOTAL	0,62	0,64	0,47	0,03	1,75	0,39	0,22	0,20	0,00	0,82	0,07	0,11	0,08	0,00	0,27	1,13	1,09	0,87	0,09	3,19	2,21	2,07	1,62	0,13	6,03	–	–	–
a) Continuous Transport	0,18	0,21	0,29	0,01	0,70	0,09	0,06	0,08	0,00	0,24	–	–	0,01	–	0,01	0,09	0,10	0,11	0,02	0,32	0,37	0,37	0,49	0,04	1,27	–	–	–
b) Discontinuous Transport	0,43	0,43	0,17	0,01	1,05	0,30	0,16	0,12	–	0,58	0,07	0,11	0,07	0,00	0,26	1,04	0,99	0,76	0,07	2,86	1,84	1,69	1,13	0,09	4,76	–	–	–
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	8,67	5,69	1,73	–	16,10	6,45	4,10	1,32	0,00	11,88	0,66	0,48	0,16	0,01	1,31	7,53	5,03	1,88	0,02	14,46	23,31	15,30	5,09	0,04	43,74	–	–	–
a) While moving about the mine	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
b) In the course of other activities	8,67	5,69	1,73	–	16,10	6,45	4,10	1,32	0,00	11,88	0,66	0,48	0,16	0,01	1,31	7,53	5,03	1,88	0,02	14,46	23,31	15,30	5,09	0,04	43,74	–	–	–
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	3,61	2,50	0,86	–	6,97	2,96	1,80	0,62	0,00	5,39	0,11	0,11	0,03	–	0,26	1,71	1,17	0,26	–	3,14	8,40	5,59	1,78	0,00	15,77	–	–	–
a) Machines	0,69	0,47	0,27	–	1,42	0,48	0,32	0,16	0,00	0,96	0,01	0,03	0,02	–	0,07	0,40	0,34	0,13	–	0,87	1,57	1,17	0,58	0,00	3,33	–	–	–
b) Tools	1,53	0,76	0,15	–	2,44	1,41	0,68	0,17	–	2,26	0,09	0,08	0,01	–	0,18	1,08	0,60	0,08	–	1,76	4,11	2,12	0,41	–	6,64	–	–	–
c) Supports	1,40	1,27	0,44	–	3,10	1,07	0,80	0,29	–	2,16	0,01	0,00	–	–	0,01	0,24	0,22	0,05	–	0,52	2,72	2,30	0,78	–	5,80	–	–	–
V. FALLS OF OBJECTS	7,27	3,88	1,50	0,00	12,65	4,42	2,13	0,88	0,00	7,44	0,31	0,19	0,11	–	0,61	3,66	1,78	0,86	0,01	6,31	15,66	7,99	3,35	0,02	27,01	–	–	–
VI. EXPLOSIVES	–	–	–	–	–	0,00	–	–	–	0,00	–	–	–	–	–	–	–	–	–	–	0,00	–	–	–	0,00	–	–	–
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_2S), TOTAL	0,00	–	–	–	0,00	0,01	0,01	–	0,03	0,07	–	–	–	–	–	0,01	–	—	–	0,01	0,03	0,01	–	0,03	0,08	–	0,03	–
a) Outbursts of Gas	–	–	–	–	–	0,01	0,01	–	0,03	0,07	–	–	–	–	–	–	–	–	–	–	0,01	0,01	–	0,03	0,07	–	0,03	–
b) De-oxygenation and Poisoning by natural Gases	0,00	–	–	–	0,00	–	–	–	–	–	–	–	–	–	–	0,01	–	–	–	0,01	0,01	–	–	–	0,01	–		–
IX. HEATINGS OR FIRES	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
X. INRUSHES	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
XI. ELECTRICITY	–	0,00	–	–	0,00	0,01	–	0,00	–	0,02	–	–	–	–	–	0,05	0,02	0,00	–	0,08	0,07	0,03	0,01	–	0,11	–	–	–
XII. OTHER CAUSES	0,35	0,22	0,09	–	0,66	0,39	0,10	0,01	0,04	0,55	0,05	0,01	0,00	–	0,06	0,31	0,21	0,05	–	0,58	1,11	0,54	0,16	0,04	1,85	–	–	–
TOTAL	27,10	16,90	6,23	0,05	50,28	21,17	11,62	4,37	0,13	37,31	1,25	0,93	0,41	0,02	2,62	15,66	9,96	4,14	0,13	29,90	65,19	39,42	15,15	0,33	120,10	–	0,03	–

(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).
(3) Calendar days.

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SAFETY AND HEALTH COMMISSION
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Common Statistics on victims
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Table 2a

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

(absolute figures)

COUNTRY: GERMANY

YEAR 1981

MAN-HOURS WORKED (1) 201 427 516

NATURE OF THE INJURY	Amputations and enucleations 1			Fractures with or without dislocation 2			Luxations, twists and sprains 3			Concussion and internal injury 4			Open wounds, contusion and muscular abrasions 5			Burns and harmful effects of electricity and radiation 6			Poisoning and suffocation 7			Multiple injuries of those not specified (2) 8			TOTAL 9				
PERIOD OF INCAPACITY	> 56 days (5)	Fatal accidents	total	> 56 days (5)	Fatal accidents	total	> 56 days (5)	Fatal accidents	total	> 56 days (5)	Fatal accidents	total	> 56 days (5)	Fatal accidents	total	> 56 days (5)	Fatal accidents	total	> 56 days (5)	Fatal accidents	total	> 56 days (5)	Fatal accidents	total	4 to 20 days (5)	21 to 56 days (5)	> 56 days (5)	Fatal accidents	total
LOCATION OF THE INJURY																													
I. Head and neck	–	–	2	46	8	210	–	–	6	13	2	91	100	1	2 134	–	–	23				1	–	6	1 771	530	160	11	2 472
II. Eyes	–	–	1							–	–	1	45	–	630	8	–	60				–	–	29	570	98	53	–	721
III. Trunk	–	–	1	127	10	372	9	–	91	5	6	29	60	13	1 626	5	–	24				2	2	6	1 158	734	228	31	2 151
IV. Upper limbs (excluding the hands) (3)	1	–	1	157	–	298	17	–	135				104	–	2 429	9	–	59				–	–	15	1 935	714	288	–	2 937
V. Hands	60	–	142	557	–	2 720	31	–	176				310	–	5 819	5	–	25				1	–	14	4 322	3 610	964	–	8 896
VI. Lower limbs (excluding feet) (4)	5	–	5	323	–	398	122	–	491				225	–	2 529	–	–	23				4	–	16	1 697	1 086	679	–	3 462
VII. Feet	16	–	16	316	–	698	121	–	907				180	–	1 689	3	–	16				2	–	18	1 597	1 109	638	–	3 344
VIII. Multiple locations	–	1	1	18	6	30	1	–	3	–	–	1	23	5	137	–	–	6				–	6	17	78	57	42	18	195
IX. Not specified													–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TOTAL	82	1	169	1 544	24	4 726	301	–	1 809	18	8	122	1 067	19	16 993	30	–	236	–	–	–	10	8	123	13 128	7 938	3 052	60	24 178

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miner's social insurance scheme.
(2) Including complications.
(3) The shoulders and the wrists are included under 'upper limbs'.
(4) The hips and the ankles are included under 'Lower limbs'.
(5) Calendar days.

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 therefor 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, haemarthosis, 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 electrictiy 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.

BELGIUM

A. COMPARATIVE TABLE OF THE NUMBER OF PERSONS INCAPACITATED BY ACCIDENTS FOR LONGER THAN 56 DAYS

FREQUENCY RATES

Years 1958 to 1981

BELGIUM	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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	4,60	4,02
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
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
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
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
6) Explosives	0,027	0,007	0,032	0,018	-	0,019	0,018	-	0,013	0,056	0,049	-	-	0,025	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
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
TOTAL	14,924	10,989	11,089	10,638	12,183	12,250	11,799	10,024	10,671	10,771	10,572	13,240	12,073	13,563	12,13	13,17

BELGIUM	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	3,99	2,79	2,77	2,55	3,43	3,25	2,4	3,03								
2) Haulage and transport	2,43	2,39	2,98	2,21	2,74	2,74	2,3	2,86								
3) Movement of personnel	1,70	1,29	1,06	0,93	1,13	1,30	0,8	1,15								
4) Machinery, handling of tools and supports	2,18	1,66	1,81	1,55	1,94	1,98	2,1	2,17								
5) Falling objects	1,84	1,46	1,63	1,16	1,98	1,98	1,9	2,25								
6) Explosives	-	-	0,03	-	-	0,00	0,00	0,00								
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	0,03	0,03	-	-	-			0,04								
12) Other causes	0,41	0,06	0,17	0,07	0,16	0,25	0,4	0,29								
TOTAL	12,58	9,68	10,45	8,47	11,38	11,50	9,90	11,79								

B. COMPARATIVE TABLE OF UNDERGROUND FATALITIES

FREQUENCY RATES

Years 1958 to 1981

BELGIUM	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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
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
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	-
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	-	0,00	0,025	-	0,03
5) Falling objects	0,016	-	0,008	-	0,010	0,019	0,018	-	-	-	0,016	-	-	-	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	-	0,00	0,00
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	0,568	0,641	0,470	0,542	0,587	0,528	0,456	0,330	0,462	0,324	0,53	0,54

BELGIUM	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	0,06	0,03	0,07	0,03	0,04	0,04	0,1	0,08								
2) Haulage and transport	0,06	0,16	0,03	0,07	0,16	0,25	0,2	0,08								
3) Movement of personnel	0,03	-	0,07	0,03	-	0,04	0,0	0,08								
4) Machinery, handling of tools and supports	-	0,09	0,03	0,03	0,04	-	0,0	0,04								
5) Falling objects	0,03	-	0,03	-	-	-	0,0	0,04								
6) Explosives	-	-	-	-	-	-	-	-								
7) Explosions of firedamp or coal dust	-	-	-	-	-	-	-	-								
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-	-	-	-	-	-								
9) Underground combustion and fires	-	-	-	0,0	-	-	-	-								
10) Inrushes of water	-	-	-	-	-	-	-	-								
11) Electricity	-	-	-	-	-	-	0,0	-								
12) Other causes	-	-	-	-	0,04	-	-	-								
TOTAL	0,18	0,28	0,23	0,16	0,28	0,33	0,3	0,32								

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

Table 1a

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

(absolute figures)

COUNTRY: BELGIUM

YEAR 1981

MAN-HOURS WORKED (1) 24 448 072

SITE OF THE ACCIDENT / Period of incapacity / 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 (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total
I. FALLS OF GROUNDS AND ROCKS	1 555	208	48	2	1 813	977	111	22	0	1 110	29	3	0	0	32	174	21	4	0	199	2 735	343	74	2	3 154			
II. TRANSPORT, TOTAL	44	15	10	0	69	171	37	29	0	237	56	11	8	0	75	161	41	23	2	227	432	104	70	2	608			
a) Continuous Transport	38	14	10	0	62	64	10	8	0	82	1	0	0	0	1	39	5	0	0	44	142	29	18	0	189			
b) Discontinuous Transport	6	1	0	0	7	107	27	21	0	155	55	11	8	0	74	122	36	23	2	183	290	75	52	2	419			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	141	15	5	0	161	352	55	15	0	422	70	14	3	2	89	189	16	5	0	210	752	100	28	2	882			
a) While moving about the mine	29	6	2	0	37	102	17	3	0	122	12	1	1	0	14	35	2	2	0	39	178	26	8	0	212			
b) In the course of other activities	112	9	3	0	124	250	38	12	0	300	58	13	2	2	75	154	14	3	0	171	574	74	20	2	670			
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	533	88	25	1	647	689	90	22	0	801	51	3	2	0	56	178	25	4	0	207	1 451	206	53	1	1 711			
a) Machines	47	13	5	1	68	52	15	7	0	74	4	0	2	0	6	16	2	0	0	18	119	30	14	1	164			
b) Tools	131	16	3	0	150	192	12	4	0	208	25	2	0	0	27	85	12	2	0	99	433	42	9	0	484			
c) Supports	355	59	17	0	431	445	63	11	0	519	22	1	0	0	23	77	11	2	0	90	899	134	30	0	1 063			
V. FALLS OF OBJECTS	526	96	24	0	646	706	84	21	0	811	100	12	3	1	116	265	30	7	0	302	1 597	222	55	1	1 875			
VI. EXPLOSIVES	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1			
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_2S), TOTAL	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	1	2	0	0	0	2			
a) Outbursts of Gas	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1			
b) De-oxygenation and Poisoning by natural Gases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1			
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	0	0	0	2	1	1	0	0	2	2	0	0	0	2	1	0	1	0	2	6	1	1	0	8			
XII. OTHER CAUSES	75	6	3	0	84	71	6	3	0	80	22	1	0	0	23	43	3	1	0	47	211	16	7	0	234			
TOTAL	2 876	428	115	3	3 422	2 969	384	112	0	3 465	330	44	16	3	393	1 012	136	45	2	1 195	7 187	992	288	8	8 475			

(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).
(3) Calendar days.

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SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

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

(frequency rates)

Table 1b

COUNTRY: BELGIUM

YEAR 1981

MAN-HOURS WORKED (1) 24 448 072

SITE OF THE ACCIDENT / Period of incapacity / CAUSES OF ACCIDENTS	Production faces 1					Headings excluding shafts and staple-pits 2					Shafts and staple-pits 3					Other places 4					Total of accidants underground 5					Group accidents (2) 6		
	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	> 56 days (3)	Fatal acci-dents	total
I. FALLS OF GROUNDS AND ROCKS	63,60	8,51	1,96	0,08	74,16	39,96	4,54	0,90	–	45,40	1,19	0,12	–	–	1,31	7,12	0,86	0,16	–	8,14	111,87	14,03	3,03	0,08	129,01			
II. TRANSPORT, TOTAL	1,80	0,61	0,41	–	2,82	6,99	1,51	1,19	–	9,69	2,29	0,45	0,33	–	3,07	6,59	1,68	0,94	0,08	9,28	17,67	4,25	2,66	0,08	24,87			
a) Continuous Transport	1,55	0,57	0,41	–	2,54	2,62	0,41	0,33	–	3,35	0,04	–	–	–	0,04	1,60	0,20	–	–	1,60	5,81	1,19	0,74	–	7,73			
b) Discontinuous Transport	0,25	0,04	–	–	0,29	4,38	1,10	0,86	–	6,34	2,25	0,45	0,33	–	3,03	4,99	1,47	0,94	0,08	7,49	11,86	3,07	2,13	0,08	17,14			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	5,77	0,61	0,20	–	6,59	14,40	2,25	0,61	–	17,26	2,86	0,57	0,12	0,08	3,64	7,73	0,65	0,20	–	8,59	30,76	4,09	1,15	0,08	36,08			
a) While moving about the mine	1,19	0,25	0,08	–	1,51	4,17	0,70	0,12	–	4,99	0,49	0,04	0,04	–	0,57	1,43	0,08	0,08	–	1,60	7,28	1,06	0,33	–	8,67			
b) In the course of other activities	4,58	0,37	0,12	–	5,07	10,23	1,55	0,49	–	12,27	2,37	0,53	0,08	0,08	3,07	6,30	0,57	0,12	–	6,99	23,48	3,03	0,82	0,08	27,41			
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	21,80	3,60	1,02	0,04	26,46	28,18	3,68	0,90	–	32,76	2,09	0,12	0,08	–	2,29	7,28	1,02	0,16	–	8,47	59,35	8,43	2,17	0,04	69,99			
a) Machines	1,92	0,53	0,20	0,04	2,70	2,13	0,61	0,29	–	3,03	0,16	–	0,08	–	0,25	0,65	0,08	–	–	0,74	4,87	1,23	0,57	0,04	6,71			
b) Tools	5,36	0,65	0,12	–	6,14	7,85	0,49	0,16	–	8,51	1,02	0,08	–	–	1,10	3,48	0,49	0,08	–	4,05	17,71	1,72	0,37	–	19,80			
c) Supports	14,52	2,41	0,70	–	17,63	18,20	2,58	0,45	–	21,23	0,90	0,04	–	–	0,94	3,15	0,45	0,08	–	3,68	36,77	5,48	1,23	–	43,48			
V. FALLS OF OBJECTS	21,51	3,93	0,98	–	26,42	28,88	3,44	0,86	–	33,17	4,09	0,49	0,12	0,04	4,74	10,84	1,23	0,29	–	12,35	65,32	9,08	2,25	0,04	76,69			
VI. EXPLOSIVES	–	–	–	–	–	0,04	–	–	–	0,04	–	–	–	–	–	–	–	–	–	–	0,04	–	–	–	0,04			
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_2S), TOTAL	–	–	–	–	–	0,04	–	–	–	0,04	–	–	–	–	–	0,04	–	–	–	0,04	0,08	–	–	–	0,08			
a) Outbursts of Gas	–	–	–	–	–	0,04	–	–	–	0,04	–	–	–	–	–	–	–	–	–	–	0,04	–	–	–	0,04			
b) De-oxygenation and Poisoning by natural Gases	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0,04	–	–	–	0,04	0,04	–	–	–	0,04			
IX. HEATINGS OR FIRES	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
X. INRUSHES	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–			
XI. ELECTRICITY	0,08	–	–	–	0,08	0,04	0,04	–	–	0,08	0,08	–	–	–	0,08	0,04	–	0,04	–	0,08	0,25	0,04	0,04	–	0,35			
XII. OTHER CAUSES	3,07	0,25	0,12	–	3,44	2,90	0,25	0,12	–	3,27	0,90	0,04	–	–	0,94	1,78	0,12	0,04	–	1,92	8,63	0,65	0,29	–	9,57			
TOTAL	117,64	17,51	4,70	0,12	139,97	121,44	15,71	4,58	–	141,73	13,50	1,80	0,65	0,12	16,07	41,39	5,56	1,84	0,08	48,88	293,97	40,58	11,78	0,33	346,65			

(1) Number of hours workad by pit staft 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).
(3) Calendar days.

C/58/V/E4/81

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

Table 2a

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

(absolute figures)

COUNTRY: BELGIUM

YEAR 1981

MAN-HOURS WORKED (1) 24 448 072

NATURE OF THE INJURY	Amputations and enucleations 1			Fractures with or without dislocation 2			Luxations, twists and sprains 3			Concussion and internal injury 4			Open wounds, contusion and muscular abrasions 5			Burns and harmful effects of electricity and radiation 6			Poisoning and suffocation 7			Multiple injuries of those not specified (2) 8			TOTAL 9					
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 (4)	21 to 56 days (4)	> 56 days (3)	Fatal accidents	total
LOCATION OF THE INJURY																														
I. Head and neck	0	0	0	3	5	8	0	0	0	2	0	2	3	0	3	0	0	0				0	0	0					
II. Eyes	0	0	0							0	0	0	6	0	6	0	0	0				0	0	0					
III. Trunk	0	0	0	6	1	7	1	0	1	0	0	0	6	0	6	0	0	0				0	1	1					
IV. Upper limbs (excluding the hands) (5)	0	0	0	18	0	18	0	0	0				16	0	16	0	0	0				0	0	0					
V. Hands	7	0	7	44	0	44	1	0	1				30	0	30	0	0	0				0	0	0					
VI. Lower limbs (excluding feet) (6)	3	0	3	36	0	36	1	0	1				52	0	52	0	0	0				0	0	0					
VII. Feet	1	0	1	16	0	16	4	0	4				21	0	21	0	0	0				0	0	0					
VIII. Multiple locations	1	0	1	2	0	2	0	0	0	0	0	0	7	0	7	1	0	1				0	0	0					
IX. Not specified													0	0	0	0	0	0	0	1	1	0	0	0					
TOTAL	12	0	12	125	6	131	7	0	7	2	0	2	141	0	141	1	0	1	0	1	1	0	1	1					

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miner's social insurance scheme.
(2) Including complications.
(3) The shoulders and the wrists are included under 'upper limbs'.
(4) The hips and the ankles are included under 'Lower limbs'.
(5) Calendar days.

C/59/V/E4/81

FRANCE

A. COMPARATIVE TABLE OF THE NUMBER OF PERSONS INCAPACITATED BY ACCIDENTS FOR LONGER THAN 56 DAYS

FREQUENCY RATES

Years 1958 to 1981

FRANCE	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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
2) Haulage and transport	1,980	1,695	1,920	2,106	2,196	2,364	2,278	2,153	1,858	1,918	1,946	1,556	1,666	1,959	1,89	2,37
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) 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
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
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	-
7) Explosions of firedamp or coal dust	0,047	0,088	-	-	0,004	-	-	0,00	0,029	-	0,00	0,00	0,087	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0,004	-	-	-	-	-	-	-	-	0,005	-	-	-	-	-	-
9) Underground combustion and fires	-	-	-	0,0	-	-	-	-	-	-	-	-	-	-	-	-
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	0,00	0,005	0,006	0,014	0,024	0,009	0,01	-
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
TOTAL	14,380	13,594	13,879	14,079	14,239	14,660	14,352	12,517	12,692	12,819	14,570	14,788	15,099	16,609	18,25	20,09

FRANCE	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	4,52	3,75	3,82	3,88	4,88	4,86	4,32	4,92								
2) Haulage and transport	2,36	2,63	2,53	2,44	3,11	2,68	3,47	3,11								
3) Movement of personnel	4,11	4,29	4,81	5,39	7,43	6,34	7,30	7,12								
4) Machinery, handling of tools and supports	2,98	2,94	3,17	3,13	3,52	3,22	3,32	4,78								
5) Falling objects	5,12	4,11	4,11	3,94	3,86	4,22	3,25	3,53								
6) Explosives	-	0,03	-	0,03	0,05	-	-	-								
7) Explosions of firedamp or coal dust	0,08	-	0,0	-	-	-	-	-								
8) Sudden outbursts of firedamp, suffocation by natural gases	-	0,01	-	0,02	0,05	-	-	-								
9) Underground combustion and fires	0,03	0,01	0,01	-	-	-	-	-								
10) Inrushes of water	-	-	-	-	0,03	0,04	0,02	-								
11) Electricity	9,01	0,03	0,03	0,02	0,03	-	0,02	-								
12) Other causes	0,63	0,64	0,49	0,47	0,63	0,78	1,18	1,04								
TOTAL	28,84	18,44	18,97	19,32	23,59	22,14	22,88	24,50								

B. COMPARATIVE TABLE OF UNDERGROUND FATALITIES

FREQUENCY RATES

Years 1958 à 1981

FRANCE*	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1) Falls of ground	0,235	0,192	0,186	0,219	0,167	0,120	0,127	0,164	0,214	0,159	0,177	0,149	0,143	0,117	0,07	0,20
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
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
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
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
6) Explosives	-	0,026	-	-	-	0,005	0,005	0,009	0,005	0,005	0,006	-	0,108	0,018	-	-
7) Explosions of firedamp or coal dust	0,115	0,121	-	-	0,004	-	-	0,155	-	-	0,038	-	0,127	-	-	-
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	-
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	-
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	0,585	0,468	0,21	0,35

FRANCE*	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	0,11	0,06	0,09	0,09	0,14	0,06	0,15	0,10								
2) Haulage and transport	0,12	0,07	0,10	0,06	0,05	0,04	0,11	0,02								
3) Movement of personnel	0,01	0,03	0,03	0,00	-	0,02	0,06	0,02								
4) Machinery, handling of tools and supports	0,03	-	0,10	-	0,02	0,02	0,02	-								
5) Falling objects	0,03	0,03	0,03	0,02	-	0,02	0,0	-								
6) Explosives	-	-	0,01	-	0,02	-	-	-								
7) Explosions of firedamp or coal dust	0,58	-	0,23	-	-	-	-	-								
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-	-	-	-	-	-	0,02								
9) Underground combustion and fires	0,01	-	-	-	-	-	-	-								
10) Inrushes of water	-	-	-	-	-	-	-	-								
11) Electricity	-	-	-	-	-	-	-	-								
12) Other causes	-	-	-	0,02	-	0,02	0,02	-								
TOTAL	0,89	0,19	0,59	0,19	0,23	0,18	0,36	0,16								

* Including Provence as from 1970

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

Table 1a

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

(absolute figures)

YEAR 1981

COUNTRY: FRANCE

MAN-HOURS WORKED (1) 48 157 872

SITE OF THE ACCIDENT / CAUSES OF ACCIDENTS / Period of incapacity	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 (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal accidents	total	> 56 days (3)	Fatal accidents	total
I. FALLS OF GROUNDS AND ROCKS	939	440	140	3	1 522	364	161	70	2	597	2	0	1	0	3	167	71	26	0	264	1 472	672	237	5	2 386			
II. TRANSPORT, TOTAL	89	49	36	0	174	52	36	14	0	102	12	4	4	0	20	265	164	96	1	526	418	253	150	1	822			
a) Continuous Transport	41	28	21	0	90	10	10	2	0	22	0	0	0	0	0	38	8	9	0	55	89	46	32	0	167			
b) Discontinuous Transport	48	21	15	0	84	42	26	12	0	80	12	4	4	0	20	227	156	87	1	471	329	207	118	1	655			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	827	488	99	0	1414	417	227	51	0	695	36	28	8	0	72	1 028	623	185	1	1 837	2 308	1 366	343	1	4 018			
a) While moving about the mine	272	143	31	0	446	143	70	13	0	226	20	12	5	0	37	498	299	83	1	881	933	524	132	1	1 590			
b) In the course of other activities	555	345	68	0	968	274	157	38	0	469	16	16	3	0	35	530	324	102	0	956	1 375	842	211	0	2 428			
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	951	467	125	0	1 543	349	144	52	0	545	9	9	2	0	20	440	196	51	0	687	1 749	816	230	0	2 795			
a) Machines	63	42	33	0	138	75	30	21	0	126	2	3	1	0	6	45	18	11	0	74	185	93	66	0	344			
b) Tools	402	156	38	0	596	175	64	18	0	257	6	4	1	0	11	270	101	27	0	398	853	325	84	0	1 262			
c) Supports	486	269	54	0	809	99	50	13	0	162	1	2	0	0	3	125	77	13	0	215	711	398	80	0	1 189			
V. FALLS OF OBJECTS	398	175	50	0	623	190	63	16	0	269	7	5	4	0	16	561	289	100	0	950	1 156	532	170	0	1 858			
VI. EXPLOSIVES	1	1	0	0	2	4	0	0	0	4	0	0	0	0	0	1	0	0	0	1	6	1	0	0	7			
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_2S), TOTAL	2	0	0	0	2	5	0	0	1	6	0	0	0	0	0	1	1	0	0	2	8	1	0	1	10			
a) Outbursts of Gas	0	0	0	0	0	2	0	0	1	3	0	0	0	0	0	1	0	0	0	1	3	0	0	1	4			
b) De-oxygenation and Poisoning by natural Gases	2	0	0	0	2	3	0	0	0	3	0	0	0	0	0	0	1	0	0	1	5	1	0	0	6			
IX. HEATINGS OR FIRES	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	1	0	0	3			
X. INRUSHES	2	1	0	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	1	0	0	4			
XI. ELECTRICITY	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	4	2	0	0	6	4	3	0	0	7			
XII. OTHER CAUSES	161	55	21	0	237	72	18	6	0	96	3	4	0	0	7	183	63	23	0	269	419	140	50	0	609			
TOTAL	3 371	1 677	471	3	5 522	1 453	649	209	3	2 314	70	51	19	0	140	2 651	1 409	481	2	4 543	7 545	3 786	1 180	8	12 519			

(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).
(3) Calendar days.

C/57/V/E4/81

SAFETY AND HEALTH COMMISSION
FOR THE MINING
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Common Statistics on victims
of accidents underground in coal mines

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

(frequency rates)

Table 1b

COUNTRY: FRANCE

YEAR 1981

MAN-HOURS WORKED (1) 48 157 872

SITE OF THE ACCIDENT / CAUSES OF ACCIDENTS / Period of incapacity	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 (3)	21 to 56 days (3)	56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total
I. FALLS OF GROUNDS AND ROCKS	19,50	9,14	2,91	0,06	31,60	7,56	3,34	1,45	0,04	12,40	0,04	–	0,02	–	0,06	3,47	1,47	0,54	–	5,48	30,57	13,95	4,92	0,10	49,55			
II. TRANSPORT, TOTAL	1,85	1,02	0,75	–	3,61	1,08	0,75	0,29	–	2,12	0,25	0,08	0,08	–	0,42	5,50	3,41	1,99	0,02	10,92	8,68	5,25	3,11	0,02	17,07			
a) Continuous Transport	0,85	0,58	0,44	–	1,87	0,21	0,21	0,04	–	0,46	–	–	–	–	–	0,79	0,17	0,19	–	1,14	1,85	0,96	0,66	–	3,47			
b) Discontinuous Transport	1,00	0,44	0,31	–	1,74	0,87	0,54	0,25	–	1,66	0,25	0,08	0,08	–	0,42	4,71	3,24	1,81	0,02	9,78	8,83	4,30	2,45	0,02	13,60			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	17,17	10,13	2,06	–	29,36	8,66	4,71	1,06	–	14,43	0,75	0,58	0,17	–	1,50	21,35	12,94	3,84	0,02	38,15	47,93	28,37	7,12	0,02	83,43			
a) While moving about the mine	5,65	2,97	0,64	–	9,26	2,97	1,45	0,27	–	4,69	0,42	0,25	0,10	–	0,77	10,34	6,21	1,72	0,02	18,29	19,37	10,88	2,74	0,02	33,02			
b) In the course of other activities	11,52	7,16	1,41	–	20,10	5,69	3,26	0,79	–	9,74	0,33	0,33	0,06	–	0,73	11,01	6,73	2,12	–	19,85	28,55	17,48	4,38	–	50,42			
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	19,75	9,70	2,60	–	32,04	7,25	2,99	1,08	–	11,32	0,19	0,19	0,04	–	0,42	9,14	4,07	1,06	–	14,27	36,32	16,94	4,78	–	58,04			
a) Machines	1,31	0,87	0,69	–	2,87	1,56	0,62	0,44	–	2,62	0,04	0,06	0,02	–	0,12	0,93	0,37	0,23	–	1,54	3,84	1,93	1,37	–	7,14			
b) Tools	8,35	3,24	0,79	–	12,38	3,63	1,33	0,37	–	5,34	0,12	0,08	0,02	–	0,23	5,61	2,10	0,56	–	8,26	17,71	6,75	1,74	–	26,21			
c) Supports	10,09	5,59	1,12	–	16,80	2,08	1,04	0,27	–	3,36	0,02	0,04	–	–	0,06	2,60	1,60	0,27	–	4,46	14,76	8,26	1,66	–	24,69			
V. FALLS OF OBJECTS	8,26	3,63	1,04	–	12,94	3,95	1,31	0,33	–	5,59	0,15	0,10	0,08	–	0,33	11,65	6,00	2,08	–	19,73	24,00	11,05	3,53	–	38,58			
VI. EXPLOSIVES	0,02	0,02	–	–	0,04	0,08	0,00	–	–	0,08	–	–	–	–	–	0,02	–	–	–	0,02	0,12	0,02	–	–	0,15			
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_2S), TOTAL	0,04	–	–	–	0,04	0,10	–	–	0,02	0,12	–	–	–	–	–	0,02	0,02	–	–	0,04	0,17	0,02	–	0,02	0,21			
a) Outbursts of Gas	–	–	–	–	–	0,04	–	–	0,02	0,06	–	–	–	–	–	0,02	–	–	–	0,02	0,06	–	–	0,02	0,08			
b) De-oxygenation and Poisoning by natural Gases	0,04	–	–	–	0,04	0,06	–	–	–	0,06	–	–	–	–	–	–	0,02	–	–	0,02	0,10	0,02	–	–	0,12			
IX. HEATINGS OR FIRES	0,02	0,02	–	–	0,04	–	–	–	–	–	–	–	–	–	–	0,02	–	–	–	0,02	0,04	0,02	–	–	0,06			
X. INRUSHES	0,04	0,02	–	–	0,06	–	–	–	–	–	0,02	–	–	–	0,02	–	–	–	–	–	0,06	0,02	–	–	0,08			
XI. ELECTRICITY	–	–	–	–	–	–	–	–	–	–	–	0,02	–	–	0,02	0,08	0,04	–	–	0,12	0,08	0,06	–	–	0,15			
XII. OTHER CAUSES	3,34	1,14	0,44	–	4,92	1,50	0,37	0,12	–	1,99	0,06	0,08	–	–	0,15	3,80	1,31	0,48	–	5,59	6,70	2,91	1,04	–	12,65			
TOTAL	70,00	34,82	9,78	0,06	114,66	30,17	13,48	4,34	0,06	48,05	1,45	1,06	0,39	–	2,91	55,05	29,26	9,99	0,04	94,34	156,67	78,62	24,50	0,17	259,96			

(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).
(3) Calendar days.

C/58/V/E4/81

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

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

(absolute figures)

Table 2a

COUNTRY: FRANCE

YEAR 1981

MAN-HOURS WORKED (1) 48 157 872

NATURE OF THE INJURY	Amputations and enucleations 1			Fractures with or without dislocation 2			Luxations, twists and sprains 3			Concussion and internal injury 4			Open wounds, contusion and muscular abrasions 5			Burns and harmful effects of electricity and radiation 6			Poisoning and suffocation 7			Multiple injuries of those not specified (2) 8			TOTAL 9				
PERIOD OF INCAPACITY	56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total
LOCATION OF THE INJURY																													
I. Head and neck	0	0	0	12	2	14	0	0	0	5	0	5	39	0	39	0	0	0				3	0	3	687	192	59	2	940
II. Eyes	0	0	0							2	0	2	13	0	13	0	0	0				0	0	0	584	46	15	0	645
III. Trunk	0	0	0	20	0	20	21	0	21	7	0	7	53	0	53	1	0	1				4	0	4	1 098	697	106	0	1 901
IV. Upper limbs (excluding the hands) (4)	0	0	0	35	0	35	18	0	18				40	0	40	0	0	0				5	0	5	873	310	98	0	1 281
V. Hands	31	0	31	234	0	234	14	0	14				117	0	117	0	0	0				5	0	5	2 004	1 233	401	0	3 638
VI. Lower limbs (excluding feet) (5)	1	0	1	87	1	88	67	0	67				101	0	101	2	0	2				3	0	3	1 104	624	261	1	1 990
VII. Feet	6	0	6	64	0	64	3	0	3				25	0	25	0	0	0				1	0	1	606	305	99	0	1 010
VIII. Multiple locations	1	0	1	51	0	51	5	0	5	3	0	3	65	0	65	1	0	1				11	3	14	556	350	137	3	1 046
IX. Not specified													4	0	4	0	0	0	0	1	1	0	1	1	43	19	4	2	68
TOTAL	39	0	39	503	3	506	128	0	128	17	0	17	457	0	457	4	0	4	0	1	1	32	4	36	7 555	3 776	1 180	8	12 519

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miner's social insurance scheme.
(2) Including complications.
(3) The shoulders and the wrists are included under 'upper limbs'.
(4) The hips and the ankles are included under 'Lower limbs'.
(5) Calendar days.

C/59/V/E4/81

UNITED KINGDOM

A. COMPARATIVE TABLE OF THE NUMBER OF PERSONS INCAPACITATED BY ACCIDENTS FOR LONGER THAN 56 DAYS

FREQUENCY RATES

Years 1958 to 1981

UNITED KINGDOM	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1) Falls of ground																
2) Haulage and transport																
3) Movement of personnel																
4) Machinery, handling of tools and supports																
5) Falling objects																
6) Explosives	Not available following the system of classification used in the Community of the VI															
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																
TOTAL																

UNITED KINGDOM	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground				1,05	1,02	0,82	0,72	0,70								
2) Haulage and transport				1,69	1,53	1,33	1,11	1,14								
3) Movement of personnel				2,03	1,72	1,38	1,22	1,34								
4) Machinery, handling of tools and supports				1,09	1,02	0,72	0,66	0,63								
5) Falling objects				0,82	0,82	0,55	0,51	0,47								
6) Explosives				0,01	0,01	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	0,92	0,69	0,64	0,55								
TOTAL				7,72	7,04	5,50	4,86	4,83								

B. COMPARATIVE TABLE OF UNDERGROUND FATALITIES

FREQUENCY RATES

Years 1958 to 1981

UNITED KINGDOM	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1) Falls of ground																
2) Haulage and transport																
3) Movement of personnel																
4) Machinery, handling of tools and supports																
5) Falling objects																
6) Explosives	Not available following the system of classification used in the Community of the VI															
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																
TOTAL																

UNITED KINGDOM	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground				0,02	0,03	0,01	0,03	0,01								
2) Haulage and transport				0,07	0,12	0,06	0,06	0,05								
3) Movement of personnel				-	-	-	-	0,01								
4) Machinery, handling of tools and supports				-	-	-	-	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				-	-	-	-	-								
12) Other causes				-	-	-		-								
TOTAL				0,09	0,15	0,11	0,09	0,07								

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

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

(absolute figures)

Table 1a

COUNTRY: UNITED KINGDOM

YEAR 1981

MAN-HOURS WORKED (1) 287 905 812

SITE OF THE ACCIDENT / CAUSES OF ACCIDENTS / Period of incapacity	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 (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	> 56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal acci-dents	total	>56 days (3)	Fatal acci-dents	total
I. FALLS OF GROUNDS AND ROCKS	1 587	511	130	1	2 229	430	147	36	2	615	0	0	0	0	0	524	180	37	0	741	2 541	838	203	3	3 585			
II. TRANSPORT, TOTAL	553	196	75	2	826	185	50	28	1	264	18	31	9	0	58	1 763	631	219	14	2 627	2 519	908	331	17	3 775			
a) Continuous Transport	33	27	14	1	75	10	6	3	1	20	0	0	0	0	0	125	53	17	2	197	168	86	34	4	292			
b) Discontinuous Transport	520	169	61	1	751	175	44	25	0	244	18	31	9	0	58	1 638	578	202	12	2 430	2 351	822	297	13	3 483			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	623	178	51	0	852	518	149	30	0	697	0	0	0	0	0	3 971	1 162	305	3	5 441	5 112	1 489	386	3	6 990			
a) While moving about the mine	168	40	14	0	222	121	40	5	0	166	0	0	0	0	0	1 941	545	147	0	2 633	2 230	625	166	0	3 021			
b) In the course of other activities	455	138	37	0	630	397	109	25	0	531	0	0	0	0	0	2 030	617	158	3	2 808	2 882	864	220	3	3 969			
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	1 221	318	80	1	1 620	482	147	26	0	655	8	4	1	0	13	1 379	401	75	0	1 855	3 090	870	182	1	4 143			
a) Machines	223	53	23	0	299	53	19	3	0	75	1	1	0	0	2	130	36	8	0	174	407	109	34	0	550			
b) Tools	104	30	9	0	143	50	11	5	0	66	1	0	1	0	2	327	94	12	0	433	482	135	27	0	844			
c) Supports	894	235	48	1	1 178	379	117	18	0	514	6	3	0	0	9	922	271	55	0	1 248	2 201	626	121	1	2 949			
V. FALLS OF OBJECTS	748	243	49	0	1 040	281	71	22	0	374	5	3	1	0	9	937	311	66	1	1 315	1 971	628	138	1	2 738			
VI. EXPLOSIVES	29	5	0	0	34	4	0	0	0	4	0	0	0	0	0	18	8	1	0	27	51	13	1	0	65			
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1			
VIII. OUTBURSTS OF GAS, DE-OXYGENATION, SUFFOCATION OR POISONING BY NATURAL GASES (CO_2, CH_4, CO, H_2S), TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	3	2	1	0	0	3			
a) Outbursts of Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1			
b) De-oxygenation and Poisoning by natural Gases	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	1	1	0	0	2			
IX. HEATINGS OR FIRES	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	3	0	0	0	3			
X. INRUSHES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	1			
XI. ELECTRICITY	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	5	0	0	0	5	6	0	0	0	6			
XII. OTHER CAUSES	551	148	33	0	732	370	102	12	0	484	10	4	0	0	14	2 072	619	116	0	2 807	3 003	873	161	0	4 037			
TOTAL	5 315	1 599	418	4	7 336	2 270	666	154	3	3 093	42	42	11	0	95	10 673	3 313	819	18	14 823	18 300	5 620	1 402	25	25 347			

(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 ware unable to resume work underground for at least eight weeks).
(3) Calendar days.

C/57/V/E4/81

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

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

(frequency rates)

Table 1b

COUNTRY: UNITED KINGDOM

YEAR 1981

MAN-HOURS WORKED (1) 287 905 812

SITE OF THE ACCIDENT / Period of incapacity / CAUSES OF ACCIDENTS	Production faces 1					Heedings 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 (3)	21 to 56 days (3)	>56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal accidents	total	4 to 20 days (3)	21 to 56 days (3)	>56 days (3)	Fatal accidents	total	>56 days (3)	Fatal accidents	total
I. FALLS OF GROUNDS AND ROCKS	5,51	1,77	0,45	0,00	7,74	1,49	0,51	0,12	0,00	2,13	–	–	–	–	–	1,81	0,62	0,12	–	2,57	8,82	2,91	0,70	0,01	12,45			
II. TRANSPORT, TOTAL	1,92	0,68	0,26	0,00	2,86	0,64	0,17	0,09	0,00	0,91	0,06	0,10	0,03	–	0,20	6,21	2,19	0,76	0,04	9,12	8,74	3,15	1,14	0,05	13,11			
a) Continuous Transport	0,11	0,09	0,04	0,00	0,26	0,03	0,02	0,01	0,00	0,06	–	–	–	–	–	0,43	0,18	0,05	0,00	0,68	0,58	0,29	0,11	0,01	1,01			
b) Discontinuous Transport	1,80	0,58	0,21	0,00	2,60	0,60	0,15	0,08	–	0,84	0,06	0,10	0,03	–	0,20	5,68	2,00	0,70	0,04	8,43	8,16	2,85	1,03	0,04	12,09			
III. FALLS AND MOVEMENT OF THE VICTIM, TOTAL	2,16	0,61	0,17	–	2,95	1,79	0,51	0,10	–	2,42	–	–	–	–	–	13,79	4,03	1,05	0,01	18,89	17,75	5,17	1,34	0,01	24,27			
a) While moving about the mine	0,58	0,13	0,04	–	0,77	0,42	0,13	0,01	–	0,57	–	–	–	–	–	6,74	1,89	0,51	–	9,14	7,74	2,17	0,57	–	10,49			
b) In the course of other activities	1,58	0,47	0,12	–	2,18	1,37	0,37	0,08	–	1,84	–	–	–	–	–	7,05	2,14	0,54	0,01	9,75	10,00	3,00	0,76	0,01	13,78			
IV. MACHINES, TOOLS AND SUPPORTS, TOTAL	4,24	1,10	0,27	0,00	5,62	1,67	0,51	0,09	–	2,27	0,02	0,01	0,00	–	0,04	4,78	1,39	0,26	–	6,44	10,73	3,02	0,63	0,00	14,38			
a) Machines	0,77	0,18	0,07	–	1,03	0,18	0,06	0,01	–	0,26	0,00	0,00	–	–	0,00	0,45	0,12	0,02	–	0,60	1,41	0,37	0,11	–	1,91			
b) Tools	0,36	0,10	0,03	–	0,49	0,17	0,03	0,01	–	0,22	0,00	–	0,00	–	0,00	1,13	0,32	0,04	–	1,50	1,67	0,46	0,09	–	2,23			
c) Supports	3,10	0,81	0,16	0,00	4,09	1,31	0,40	0,06	–	1,78	0,02	0,01	–	–	0,03	3,20	0,94	0,19	–	4,33	7,64	2,17	0,42	0,00	10,24			
V. FALLS OF OBJECTS	2,59	0,84	0,17	–	3,61	0,97	0,24	0,07	–	1,29	0,01	0,01	0,00	–	0,03	3,25	1,08	0,22	0,00	4,56	6,84	2,18	0,47	0,00	9,50			
VI. EXPLOSIVES	0,10	0,01	–	–	0,11	0,01	–	–	–	0,01	–	–	–	–	–	0,06	0,02	0,00	–	0,09	0,17	0,04	0,00	–	0,22			
VII. IGNITIONS OR EXPLOSIONS OF FIREDAMP AND COAL DUST	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_2S), TOTAL	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0,00	0,00	–	–	0,01	0,00	0,00	–	–	0,01			
a) Outbursts of Gas	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0,00	–	–	–	0,00	0,00	–	–	–	0,00			
b) De-oxygenation and Poisoning by natural Gases	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0,00	0,00	–	–	0,00	0,00	0,00	–	–	0,00			
IX. HEATINGS OR FIRES	0,00	–	–	–	0,00	–	–	–	–	–	–	–	–	–	–	0,00	–	–	–	0,00	0,01	–	–	–	0,01			
X. INRUSHES	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0,00	–	–	–	0,00	0,00	–	–	–	0,00			
XI. ELECTRICITY	–	–	–	–	–	–	–	–	–	–	0,00	–	–	–	0,00	0,01	–	–	–	0,01	0,02	–	–	–	0,02			
XII. OTHER CAUSES	1,91	0,51	0,11	0,00	2,54	1,28	0,35	0,04	–	1,68	0,03	0,01	–	–	0,04	7,19	2,14	0,40	–	9,74	10,42	3,03	0,55	–	14,02			
TOTAL	18,45	5,55	1,45	0,01	25,47	7,88	2,31	0,53	0,01	10,74	0,14	0,14	0,03	–	0,32	37,06	11,50	2,84	0,06	51,48	63,55	19,51	4,86	0,08	88,03			

(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).
(3) Calendar days.

C/58/V/E4/81

SAFETY AND HEALTH COMMISSION
FOR THE MINING
AND OTHER EXTRACTIVE INDUSTRIES

Common Statistics on victims
of accidents underground in coal mines

Table 2a

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

(absolute figures)

YEAR 1981

COUNTRY: UNITED KINGDOM

MAN-HOURS WORKED (1) 287 905 812

NATURE OF THE INJURY	Amputations and enucleations			Fractures with or without dislocation			Luxations, twists 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				
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	12	1	63	7	0	136	0	0	0	31	1	1 167	1	0	7				0	2	6	1 097	227	51	4	1 379
II. Eyes	0	0	0							0	0	0	11	0	366	0	0	1				12	0	414	675	83	23	0	781
III. Trunk	1	0	1	19	0	72	189	0	4 283	0	0	0	65	0	1 478	0	0	3				0	2	5	4 439	1 127	274	2	5 842
IV. Upper limbs (excluding the hands) (4)	0	0	0	36	0	120	21	0	449				40	0	1 258	0	0	13				0	0	7	1 358	392	97	0	1 847
V. Hands	26	0	94	49	0	455	8	0	180				175	0	5 333	0	0	13				0	0	21	4 147	1 691	258	0	6 096
VI. Lower limbs (excluding feet) (5)	1	0	2	156	0	258	137	0	2 500				138	0	2 944	1	0	12				1	0	9	4 091	1 200	434	0	5 725
VII. Feet	3	0	5	35	0	186	2	0	110				63	0	1 526	0	0	1				1	0	4	1 227	501	104	0	1 832
VIII. Multiple locations	0	0	0	36	5	81	29	0	493	0	0	0	63	2	686	1	0	10				4	2	15	563	222	133	9	1 285
IX. Not specified													15	1	381	8	0	59	0	1	1	5	8	119	703	177	28	10	560
TOTAL	31	0	102	343	6	1 235	393	0	8 151	0	0	0	601	4	15 139	11	0	119	0	1	1	23	14	600	18 300	5 620	1 402	25	25 347

(1) Number of hours worked by pit staff and employees of contractor firms who belong to a miner's social insurance scheme.
(2) Including complications.
(3) The shoulders and the wrists are included under 'upper limbs'.
(4) The hips and the ankles are included under
(5) Calendar days.

C/59/V/E4/81

ITALY

A. COMPARATIVE TABLE OF THE NUMBER OF PERSONS INCAPACITATED BY ACCIDENTS FOR LONGER THAN 56 DAYS

FREQUENCY RATES

Years 1958 to 1981
Production stopped since 1976

ITALY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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	-	-
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		
6) Explosives	0,167	-	-	0,225	-	0,366	-	-	-	-	-	-	-	-	-	-
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	0,334	0,591	0,603	0,451	-	-	-	1,592	3,360	3,189	0,812	-	5,172	0,851	-	
TOTAL	6,197	6,029	7,032	5,861	7,654	7,690	11,168	15,124	18,201	31,089	16,415	16,817	12,068	16,170	2,20	3,25

ITALY	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	-	-														
2) Haulage and transport	-	-														
3) Movement of personnel	-	-														
4) Machinery, handling of tools and supports	-	4,00														
5) Falling objects	1,64	-	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	-	-														
12) Other causes	-	-														
TOTAL	1,64	4,00														

B. COMPARATIVE TABLE OF UNDERGROUND FATALITIES FREQUENCY RATES

Years 1958 à 1981
Production stopped since 1976

ITALY	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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	0,225	-	0,366	-	-	-	1,594	-	-	-	-	2,20	

ITALY	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	-	-														
2) Haulage and transport	-	-														
3) Movement of personnel	-	-														
4) Machinery, handling of tools and supports	-	-														
5) Falling objects																
6) Explosives	-	- Production stopped														
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	-	-														
TOTAL	-	-														

NETHERLANDS

A. COMPARATIVE TABLE OF THE NUMBER OF PERSONS INCAPACITATED BY ACCIDENTS FOR LONGER THAN 56 DAYS

FREQUENCY RATES

Years 1958 -1974
Production stopped since 1975

NETHERLANDS	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
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
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
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
4) Machinery, handling of tolls 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
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
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	5,052	6,211	7,583	6,025	6,629	7,737	8,291	7,497	8,939	9,375	8,891	9,200	9,16	10,658

NETHERLANDS	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	1,041															
2) Haulage and transport	2,603															
3) Movement of personnel	0,521															
4) Machinery, handling of tolls and supports	4,686															
5) Falling objects	1,562	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	-															
12) Other causes	-															
TOTAL	10,413															

8. COMPARATIVE TABLE OF UNDERGROUND FATALITIES

FREQUENCY RATES

Years 1958 to 1981
Production stopped since 1975

NETHERLANDS	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1) Falls of ground	0,262	0,064	0,034	0,114	0,062	0,084	0,043	0,044	0,050	0,100	0,172	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	-	-	-	-	-	-	-	-	-	-	-	0,058	-	-	-	-
4) Machinery, handling of tolls and supports	0,015	0,016	-	-	0,041	-	-	0,022	-	0,067	-	0,117	-	-	-	-
5) Falling objects	-	0,016	-	-	-	-	0,043	-	-	-	0,043	-	-	-	-	-
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	0,354	0,241	0,118	0,228	0,165	0,189	0,258	0,243	0,176	0,167	0,301	0,233	0,247	0,101	0,26	-

NETHERLANDS	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
1) Falls of ground	-															
2) Haulage and transport	-															
3) Movement of personnel	-															
4) Machinery, handling of tolls and supports	-															
5) Falling objects	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	-															
12) Other causes	-															
TOTAL	0,521															

SECTION IV

STATISTICAL TABLES FOR THE EXTRACTIVE INDUSTRIES OTHER THAN THE COAL INDUSTRY

FEDERAL REPUBLIC OF GERMANY

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 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	41	88 459 864	t netto	187 647
LIGNITE	O(+S)	35	130 660 980	t	19 650
OIL	D	146	4 458 967	t	7 761
NATURAL GAS	D	265	18 027 261	1000 m^3	
IRON (ORE)	S	6	1 574 646	t	842
ALUMINIUM (ORE)	S	5	79	t	-
COPPER (ORE)	S	2	1 431	t (Cu)	1 031
LEAD (ORE)	S		21 552	t (Ph)	
ZINC (ORE)	S		91 827	t (Zn)	
POTASH SALTS	S	11	5 228 206	1(K_2O)	8 794
ROCK SALTS	S	13	8 367 403	t	1 725
MARBLE	-	-	-	-	-
MARBLE FOR POLISHING	-	-	-	-	-
MARBLE FOR SEDIMENTARY	-	-	-	-	-
MARBLE IGNEAOUS	-	-	-	-	-
SLATE	S + O	21	49 858	t	387
FOUNDRY AND INDUSTRIAL SANDS	O	5	11 112	t	14
ALLUVIAL SANDS AND GRAVEL	O	-		Mio t	

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

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES

OTHER THAN COAL

1981 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 - BUILDING STONE - PAVING STONE - MONUMENTAL STONE					
HARD CRUSHED STONE - FOR CONCRETE - ROAD BASES - SURFACING					
CHALK	O + S	40	1 317 080	t	1 544
GYPSUM	O	2	12 613	t	49
STEATITE	O	23	474 640	t	1 625
KAOLIN	O	10	96 330	t	145
PEGMATITE	O	4	3 456	t	15
CALCSPAR	O	1	32 936 000	Stück	25
CALCSANDSTONE	O	1	615 980	t	41
DOLOMITE	D	3	834 122	t	191
SULPHUR	S	6	482 587	t	776
PYRITE	S	1	10 445	t	190
GRAPHITE	S	10	71 808	t	125

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES

OTHER THAN COAL

1981 FEDERAL REPUBLIC OF GERMANY

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
FLEDSPAR	S	13	342 148	t	162
URANIUM	S	14	6 560	t	126
TALC	O	4	2 828	t	14
LIMESTONE	S	9	2 004 345	t	149
BARYTES	O + S	5	177 308	t	277

BELGIUM

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981

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	S	1	(a)	111^3	12
MARBLE FOR POLISHING SEDIMENTARY, IGNEOUS	O	3	186.604	m^2(20mm)	13
SLATE	S + O	7	2.995	t	61
FOUNDRY AND INDUSTRIAL SANDS	O	233	12.088.134	t	1.104
ALUVIAL SANDS AND GRAVEL	O	65	5.244.356	t	938
HARD DIMENSION STONE BUILDING STONE PAVING STONE MONUMENTAL STONE	O	75	95.488	t	271

S : DEEP MINING
O : OPENCAST MINING
D : BOREHOLES

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981

BELGIUM

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
HARD CRUSHED STONE - FOR CONCRETE - ROAD BASES - SURFACING	0	77	28.912.461	t	2.067
HARD STONE FOR CALCINCATION					
- FOR LIME KILNS	0	19	4.227.487	t	1.255
- FOR CEMENT	0	4	4.385.810	t	115
CHALK		2	226.744	t	20
DOLOMITE	0	11	3.327.680	t	412
KAOLIN	0	5	39.685	t	6
CLAYS	0	108	4.100.000 *	t	4.199

* Estimate

DENMARK

The figures for 1981 are not available

FRANCE

The figures for 1981 are not available.

IRELAND

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 IRELAND

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL	S	9	45.883	saleable	293
	O	3	21.074		15
LIGNITE					
OIL	D	7	**Nil**	-	500
NATURAL GAS	D	2	49.072	M.S.C.F.	32
IRON					
COPPER (ore)	S	2	419.700	R.O.M.	234
			13.907	Cu conc.	
	O	1	339.840	R.O.M.	7
LEAD	S	2	1.579.900		1447
ZINC			51.066	Pb conc.	
			223.315	Zn conc.	
SILVER	O	1	185.327 ozs		60
POTASH SALTS					
ROCK SALTS					
MARBLE - FOR POLISHING - SEDIMENTARY - IGNEOUS	O	3	N.A.	-	13
SANDS(SLATE, FOUNDRY AND INDUSTRIAL SANDS)					
ALLUVIAL SANDS AND GRAVEL	O	295	N.A.	-	870

S : DEEP MINING
O : OPENCAST MINING OR QUARRYING
D : BOREHOLES

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 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					
- PAVING STONE	0	8	N.A.	-	15
- MONUMENTAL STONE	0	21	N.A.	-	190
HARD CRUSHED STONE	0	54	N.A.	-	712
- FOR CONCRETE					
- ROAD BASES					
- SURFACING					
HARD STONE FOR CALCINATION					
- FOR LIME					
- FOR CEMENT KILNS	0	2	N.A.	-	38
CHALK					
GYPSUM	S	2	360.317	qualité marchande	75
OTHER ROCKS :					
LIMESTONE	0	76	N.	-	1.342
SHALE	0	16	N.	-	34
BARYTES	S	1	22.450	conc.	45
	0	2	251.539	conc.	90
PYRITE	S + 0	(*)	22.627	conc.	(*)
CLAY	0	5	N.	-	16

(*) : byproduct of Copper ores referred to previously

ITALY

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981

ITALY

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL	S	1	-		235
LIGNITE	O	2	1.957.960		637
OIL	D	131	1.460.230		872
NATURAL GAS	D		14.043.101	KNm^3	
IRON	S	2	123.407	41 % Fe	286
ALUMINIUM	D	2	19.000	50%Al_2O_3	14
COPPER	S	2	2.886	26 % Cu	145
LEAD	S	11	21.030	61,7% Pb	2.021
ZINC	S		43.785	50 % Zn	
POTASH SALTS	S	3	1.417.789	12% K_2O	1.308
ROCK SALT	S + D	9	3.610.018		273
MARBLE					
- FOR POLISHING	O	921	2.217	000 t	5.721
- SEDIMENTARY	O	100	896	000 t	1.256
- IGNEOUS					
SLATE	S + O	129	1.021	000 t	379
FOUNDRY AND INDUSTRIAL SANDS	O	99	4.189	000 t	495
ALLUVIAL SANDS AND GRAVEL	O	2.270	123.140	000 t	7.515

D : BOREHOLES
S : DEEP MINING
O : OPENCAST MINING OR QUARRYING

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 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	0		19.681	000 t	
- PAVING STONE					
- MONUMENTAL STONE	0	2.473	13.036	000 t	15.025
HARD CRUSHED STONE					
- FOR CEMENT - ROAD BASES AND SURFACING	0		65.520	000 t	
HARD STONE FOR CALCINING					
- FOR LIME FURNACES - FOR CEMENT	0		57.167	000 t	
CHALK					
GYPSUM	0	100	4.820	000 t	564
CLAY	0	1.036	35.442	000 t	2.664
DOLOMITE	0	31	1.176	000 t	109
PYRITE	S	3	680.968	38 % S	718
MANGANESE	S	1	8.756	29,8% Mn	11
SULPHUR	S	10	92.202	23 % S	1.316
CARBONIC ANHYDRITE	D	12	45.407		133

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 ITALY

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
ASBESTOS	O	1	137.086		290
BARITE	S	11	177.005		359
FELDSPAR	O	10	428.485		111
FLUORSPAR	S	7	164.235		593
GRAPHITE	S	1	3.535		20
MARL	O	25	13.405.774		286
ASPHALTIC ROCK FOR SURFACING BITUMINOUS ROCK	O	3	105.984		16
HYDRATED ALUMINIUM SILICATES	O	27	657.440		209
TALC AND STEATITE	S	10	163.708		398
MERCURY	S	2	20.017	0,9 % Hg	287
ANTIMONY	S	1	1.323	52,5% Sb	57
CELESTITE	O	1	6.697		9
STEAM	D		29.649.265		560

LUXEMBURG

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 LUXEMBURG

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL					
LIGNITE					
OIL					
NATURAL GAS					
IRON (Silicious)	S O	1 1	429.080	t	165
LEAD					
ZINC					
POTASH SALTS					
ROCK SALTS					
MARBLE - FOR POLISHING - SEDIMENTARY - IGNEOUS					
SLATE					
FOUNDRY AND INDUSTRIAL SANDS					
ALLUVIAL SANDS AND GRAVEL					

S : DEEP MINING
O : OPENCAST MINING OR QUARRYING
D : BOREHOLES

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 LUXEMBOURG

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			8.740	m^3	
- PAVING STONE					
- MONUMENTAL STONE			564	m^3	
- SIZED STONE			1.178	m^2	
- FACING STONE					
HARD CRUSHED STONE	0		713.026	t	
- FOR CONCRETE	0	30			166
- ROAD BASES AND SURFACING	S				
HARD STONE FOR CALCINING					
- FOR LIME FURNACES					
- FOR CEMENT					
SAND			713.285	t	
GRAVEL			190.951	t	
OTHER ROCKS :					
SLATE	S	1	1.298	1000 p	
- POLISHED SIZED STONE			1.943	m^2	52
- SIZED STONE			275	t	
PLASTER	S	1	702	t	15

NETHERLANDS

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 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	1.315.062	Kg Ton	
NATURAL GAS	D	6	87.000×10^6	1000 m^3	
IRON					
ALUMINIUM					
COPPER					
LEAD					
ZINC					
MAGNESIUM	D	1	3.147	Ton	10
ROCK SALTS	D	1	2.443.302	Ton	55
MARBLE - FOR POLISHING - SEDIMENTARY - IGNEOUS					
SLATE					
FOUNDRY AND INDUS-TRIAL SANDS					
ALLUVIAL SANDS AND GRAVEL	O		$28^5 \times 10^6$	Ton	

S : DEEP MINING
O : OPENCAST MINING OR QUARRYING
D : BOREHOLES

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 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	2.460.169	Ton	80
SANDSTONE	0	1	158.000	Ton	4

UNITED KINGDOM

STATISTICAL TABLES FOR EXTRACTIVE INDUSTRIES OTHER THAN COAL

1981 UNITED KINGDOM

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
COAL					
LIGNITE					
OIL					
NATURAL GAS					
IRONSTONE					
ALUMINIUM					
COPPER	S		0,2		
LEAD	S		3,6	thou-sand tonnes	1.267
ZINC	S		4,4		
TIN	S		3,3		
WOLFRAM	S				
POTASH SALTS					
ROCK SALTS					
MARBLE FOR POLISHING - FOR POLISHING - SEDIMENTARY - IGNEOUS					
SLATE	O		0,2		654
FOUNDRY AND INDUSTRIAL SANDS	O		5,7		1.301
ALLUVIAL SANDS AND GRAVEL	O		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

1981 UNITED KINGDOM

MINERAL	MINE, QUARRY OR BORE-HOLE	NUMBER OF SITES WHERE MINERAL IS WORKED	PRODUCTION	TONS ROM ORE OF MINERAL	PERSONS
LINESTONE	S + O		72,4	million tonnes	10.169
CLAY SHALE	O		19,8	"	1.413
CHALK & CHERT	O		13,7	"	1.134
IGNEOUS ROCK	O		28,5	"	5.248
SANDSTONE	O		9,8	"	2.056
CLAY	S + O		3,96	"	3.567
CALCSPARE	S + O		0,018	"	39
GYPSUM & ANHYDRITE	S + O		3,45	"	615

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