

COMMISSION OF THE EUROPEAN COMMUNITIES

FOURTH REPORT
OF THE
MINES SAFETY AND HEALTH
COMMISSION

ANNEXES



DECEMBER 1967

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I. COMMON STATISTICAL SUMMARY OF UNDERGROUND
ACCIDENTS AT MINES IN 1965

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Germany (Land North
Rhine/Westphalia)
Coal-field: Ruhr

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	1,511	66		4.701	0.206	-	-	-
2) Haulage and transport	699	53		2.175	0.165	-	-	-
3) Movement of personnel	978	25		3.043	0.078	-	-	-
4) Machinery, handling of tools and supports	421	11		1.310	0.034	-	-	-
5) Falling objects	997	19		3.102	0.059	-	-	-
6) Explosives and fumes	1	-		0.003	-	-	-	-
7) Explosions of firedamp or coal dust	4	8		0.012	0.025	1	4	8
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.003	-	-	-
9) Underground combustion and fires	-	2		-	0.006	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	1	2		0.003	0.006	-	-	-
12) Other causes	150	10		0.467	0.031	-	-	-
TOTAL	4,762	197	321,406,032	14.816	0.613	1	4	8

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Germany (Land North
Rhine/Westphalia)
Coal-field: Aachen

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	231	11		3.635	0.173	-	-	-
2) Haulage and transport	188	19		2.958	0.299	-	-	-
3) Movement of personnel	153	5		2.408	0.079	-	-	-
4) Machinery, handling of tools and supports	39	-		0.614	-	-	-	-
5) Falling objects	182	5		2.864	0.079	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
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	793	40	63,547,496	12.479	0.629	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Germany (Land North
Rhine/Westphalia)
Coal-field:

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	1,742	77		4.525	0.200	-	-	-
2) Haulage and transport	887	72		2.304	0.187	-	-	-
3) Movement of personnel	1,131	30		2.938	0.078	-	-	-
4) Machinery, handling of tools and supports	460	11		1.195	0.028	-	-	-
5) Falling objects	1,179	24		3.063	0.062	-	-	-
6) Explosives and fumes	1	-		0.002	-	-	-	-
7) Explosions of firedamp or coal dust	4	8		0.010	0.021	1	4	8
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.002	-	-	-
9) Underground combustion and fires	-	2		-	0.005	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	1	2		0.002	0.005	-	-	-
12) Other causes	150	10		0.390	0.026	-	-	-
TOTAL	5,555	237	384,953,528	14.429	0.614	1	4	8

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Germany

Coal-field: Saar

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	287	2		6.547	0.046	-	-	-
2) Haulage and transport	147	10		3.353	0.228	-	-	-
3) Movement of personnel	169	-		3.855	-	-	-	-
4) Machinery, handling of tools and supports	69	-		1.574	-	-	-	-
5) Falling objects	255	1		5.817	0.023	-	-	-
6) Explosives and fumes	1	-		0.023	-	-	-	-
7) Explosions of firedamp or coal dust	2	-		0.046	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	2	-		0.046	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	2	-		0.046	-	-	-	-
TOTAL	934	13	43,835,225	21.307	0.297	-	-	-

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Germany

Coal-field: North Rhine/Westphalia
and Saar

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	2,029	79		4.732	0.184	-	-	-
2) Haulage and transport	1,034	82		2.411	0.191	-	-	-
3) Movement of personnel	1,300	30		3.032	0.070	-	-	-
4) Machinery, handling of tools and supports	529	11		1.234	0.025	-	-	-
5) Falling objects	1,434	25		3.344	0.058	-	-	-
6) Explosives and fumes	2	-		0.005	-	-	-	-
7) Explosions of firedamp or coal dust	6	8		0.014	0.019	1	4	8
8) Sudden outbursts of firedamp, suffocation by natural gases	2	1		0.005	0.002	-	-	-
9) Underground combustion and fires	-	2		-	0.005	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	1	2		0.002	0.005	-	-	-
12) Other causes	152	10		0.354	0.023	-	-	-
TOTAL	6,489	250	428,788,753	15.133	0.582	1	4	8

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Belgium

Coal-field: Charleroi-Namur

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	101	9		4.314	0.384	-	-	-
2) Haulage and transport	84	6		3.588	0.256	-	-	-
3) Movement of personnel	23	-		0.982	-	-	-	-
4) Machinery, handling of tools and supports	65	-		2.776	-	-	-	-
5) Falling objects	11	-		0.470	-	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
7) Explosions of firedamp or coal dust	2	1		0.085	0.043	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-		-	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	1	-		0.043	-	-	-	-
12) Other causes	17	-		0.726	-	-	-	-
TOTAL	304	16	23,413,480	12.984	0.683	-	-	-

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Belgium

Coal-field: Liège

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	65	7		3.908	0.421	-	-	-
2) Haulage and transport	47	4		2.826	0.241	-	-	-
3) Movement of personnel	18	1		1.082	0.060	-	-	-
4) Machinery, handling of tools and supports	29	1		1.744	0.060	-	-	-
5) Falling objects	4	-		0.240	-	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
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	3	-		0.180	-	-	-	-
TOTAL	166	13	16,630,808	9.980	0.782	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Belgium

Coal-field: Borinage/Centre

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	69	4		5.318	0.308			
2) Haulage and transport	51	1		3.931	0.077			
3) Movement of personnel	12	-		0.925	-			
4) Machinery, handling of tools and supports	40	-		3.083	-			
5) Falling objects	6	-		0.462	-			
6) Explosives and fumes	-	-		-	-			
7) Explosions of firedamp or coal dust	-	-		-	-			
8) Sudden outbursts of firedamp, suffocation by natural gases	-	4		-	0.308			
9) Underground combustion and fires	-	-		-	-			
10) Inrushes of water	-	-		-	-			
11) Electricity	-	-		-	-			
12) Other causes	7	-		0.540	-			
TOTAL	185	9	12,974,240	14.259	0.693			

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Belgium

Coal-field: South

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	235	20		4.432	0.377			
2) Haulage and transport	182	11		3.433	0.208			
3) Movement of personnel	53	1		0.999	0.019			
4) Machinery, handling of tools and supports	134	1		2.527	0.019			
5) Falling objects	21	-		0.396	-			
6) Explosives and fumes	-	-		-	-			
7) Explosions of firedamp or coal dust	2	1		0.038	0.019			
8) Sudden outbursts of firedamp, suffocation by natural gases	-	4		-	0.075			
9) Underground combustion and fires	-	-		-	-			
10) Inrushes of water	-	-		-	-			
11) Electricity	1	-		0.019	-			
12) Other causes	27	-		0.509	-			
TOTAL	655	38	53,018,528	12.353	0.717			

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Belgium

Coal-field: Campine

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	108	3		2.519	0.070			
2) Haulage and transport	93	5		2.169	0.117			
3) Movement of personnel	21	-		0.490	-			
4) Machinery, handling of tools and supports	70	4		1.632	0.093			
5) Falling objects	7	-		0.163	-			
6) Explosives and fumes	-	-		-	-			
7) Explosions of firedamp or coal dust	1	-		0.023	-			
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-		-	-			
9) Underground combustion and fires	2	1		0.047	0.023			
10) Inrushes of water	-	-		-	-			
11) Electricity	-	1		-	0.023			
12) Other causes	5	-		0.116	-			
TOTAL	307	14	42,866,456	7.159	0.326			

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Belgium

Coal-field: (Whole country)

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	343	23		3.574	0.239			
2) Haulage and transport	275	16		2.866	0.166			
3) Movement of personnel	74	1		0.771	0.011			
4) Machinery, handling of tools and supports	204	5		2.126	0.052			
5) Falling objects	28	-		0.292	-			
6) Explosives and fumes	-	-		-	-			
7) Explosions of firedamp or coal dust	3	1		0.031	0.011			
8) Sudden outbursts of firedamp, suffocation by natural gases	-	4		-	0.041			
9) Underground combustion and fires	2	1		0.021	0.011			
10) Inrushes of water	-	-		-	-			
11) Electricity	1	1		0.010	0.011			
12) Other causes	32	-		0.333	-			
TOTAL	962	52	95,884,984	10.024	0.542			

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: France

Coal-field: Nord/Pas-de-Calais

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	518	24		3.942	0.182	-	-	-
2) Haulage and transport	252	3		1.918	0.023	-	-	-
3) Movement of personnel	222	6		1.690	0.046	-	-	-
4) Machinery, handling of tools and supports	313	1		2.382	0.008	-	-	-
5) Falling objects	229	1		1.743	0.008	-	-	-
6) Explosives and fumes	2	-		0.015	-	-	-	-
7) Explosions of firedamp or coal dust	-	21		-	0.160	1	-	21
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-		-	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	1	-		0.008	-	-	-	-
12) Other causes	20	-		0.152	-	-	-	-
TOTAL	1,557	56	131,397,184	11.850	0.427	1	-	21

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: France
Coal-field: Centre-Midi (excl. Provence)

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	195	-		4.915	0.126	-	-	-
2) Haulage and transport	133	8		3.352	0.202	-	-	-
3) Movement of personnel	115	1		2.898	0.025	-	-	-
4) Machinery, handling of tools and supports	231	1		5.322	0.025	-	-	-
5) Falling objects	87	1		2.193	0.025	-	-	-
6) Explosives and fumes	1	-		0.025	-	-	-	-
7) Explosions of firedamp or coal dust	-	12		-	0.303	1	-	12
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-		-	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	1		-	0.025	-	-	-
11) Electricity	2	-		0.050	-	-	-	-
12) Other causes	16	-		0.403	-	-	-	-
TOTAL	780	29	39,678,152	19.658	0.731	1	-	12

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: France

Coal-field: Lorraine

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	127	6		3.016	0.141			
2) Haulage and transport	74	-		1.757	-			
3) Movement of personnel	108	2		2.565	0.047			
4) Machinery, handling of tools and supports	47	-		1.116	-			
5) Falling objects	76	2		1.805	0.047			
6) Explosives and fumes	5	2		0.119	0.047			
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	-		0.024	-			
TOTAL	438	12	42,108,656	10.402	0.284			

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: France

Coal-field: (Whole country, excl. Provence)

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	840	35		3.941	0.164	-	-	-
2) Haulage and transport	459	11		2.153	0.052	-	-	-
3) Movement of personnel	445	9		2.087	0.042	-	-	-
4) Machinery, handling of tools and supports	591	2		2.272	0.009	-	-	-
5) Falling objects	392	4		1.839	0.019	-	-	-
6) Explosives and fumes	8	2		0.037	0.009	-	-	-
7) Explosions of firedamp or coal dust	-	33		-	0.155	2	-	33
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-		-	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	1		-	0.005	-	-	-
11) Electricity	3	-		0.014	-	-	-	-
12) Other causes	37	-		0.174	-	-	-	-
TOTAL	2,775	97	213,183,992	13.017	0.455	2	-	33

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Italy

Coal-field: Sulcis

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	7	-		5.572	-	-	-	-
2) Haulage and transport	-	-		-	-	-	-	-
3) Movement of personnel	-	-		-	-	-	-	-
4) Machinery, handling of tools and supports	9	-		7.164	-	-	-	-
5) Falling objects	1	-		0.796	-	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
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	2	-		1.592	-	-	-	-
TOTAL	19	-	1,256,272	15.124	-	-	-	-

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1965
Country: Netherlands

Coal-field: Limburg

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	87	2		1.923	0.044			
2) Haulage and transport	127	8		2.808	0.177			
3) Movement of personnel	35	-		0.774	-			
4) Machinery, handling of tools and supports	58	1		1.282	0.022			
5) Falling objects	39	-		0.862	-			
6) Explosives and fumes	-	-		-	-			
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	4	-		0.088	-			
TOTAL	350	11	45,232,560	7.737	0.243			

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMPARATIVE TABLE OF NUMBERS OF PERSONS
 INCAPACITATED BY UNDERGROUND ACCIDENTS FOR EIGHT WEEKS OR LONGER
 IN 1965,
 PER MILLION MAN-HOURS

C A U S E	Germany (Land North Rhine/Westpha- lia + Saar	Belgium	France (excl. Provence)	Italy	Netherlands	Community
	1965	1965	1965	1965	1965	1965
1) Falls of ground	4.732	3.574	3.941	5.572	1.923	4.215
2) Haulage and transport	2.411	2.866	2.153	-	2.808	2.416
3) Movement of personnel	3.032	0.771	2.087	-	0.774	2.364
4) Machinery, handling of tools and supports	1.234	2.126	2.272	7.164	1.282	1.773
5) Falling objects	3.344	0.292	1.839	0.796	0.862	2.415
6) Explosives and fumes	0.005	-	0.037	-	-	0.013
7) Explosions of firedamp or coal dust	0.014	0.031	-	-	-	0.011
8) Sudden outbursts of firedamp, suffocation by natural gases	0.005	-	-	-	-	0.002
9) Underground combustion and fires	-	0.021	-	-	-	0.002
10) Inrushes of water	-	-	-	-	-	-
11) Electricity	0.002	0.010	0.014	-	-	0.006
12) Other causes	0.354	0.333	0.174	1.592	0.088	0.289
TOTAL	15.133	10.024	13.017	15.124	7.737	13.506

COMPARATIVE TABLE OF ACCIDENTS
 RESULTING IN DEATH WITHIN EIGHT WEEKS
 IN 1965,
 PER MILLION MAN-HOURS

C A U S E	Germany (Land North Rhine/Westpha- lia + Saar)	Belgium	France (excl. Provence)	Italy	Netherlands	Community
	1965	1965	1965	1965	1965	1965
1) Falls of ground	0.184	0.239	0.164	-	0.044	0.177
2) Haulage and transport	0.191	0.166	0.052	-	0.177	0.149
3) Movement of personnel	0.070	0.011	0.042	-	-	0.051
4) Machinery, handling of tools and supports	0.025	0.052	0.009	-	0.022	0.024
5) Falling objects	0.058	-	0.019	-	-	0.037
6) Explosives and fumes	-	-	0.009	-	-	0.002
7) Explosions of firedamp or coal dust	0.019	0.011	0.155	-	-	0.053
8) Sudden outbursts of firedamp, suffocation by natural gases	0.002	0.041	-	-	-	0.006
9) Underground combustion and fires	0.005	0.011	-	-	-	0.005
10) Inrushes of water	-	-	0.005	-	-	0.001
11) Electricity	0.005	0.011	-	-	-	0.004
12) Other causes	0.023	-	-	-	-	0.013
TOTAL	0.582	0.542	0.455	-	0.243	0.522

COMPARATIVE TABLE OF UNDERGROUND GROUP ACCIDENTS
(SEE (c) BELOW)
IN 1965

C A U S E	Germany (Land North Rhine/Westphalia + Saar)	Belgium	France (excl. Provence)	Italy	Netherlands	Community
	N a b	N a b	N a b	N a b	N a b	N a b
1) Falls of ground	- - -	- - -	- - -	- - -	- - -	- - -
2) Haulage and transport	- - -	- - -	- - -	- - -	- - -	- - -
3) Movement of personnel	- - -	- - -	- - -	- - -	- - -	- - -
4) Machinery, handling of tools and supports	- - -	- - -	- - -	- - -	- - -	- - -
5) Falling objects	- - -	- - -	- - -	- - -	- - -	- - -
6) Explosives and fumes	- - -	- - -	- - -	- - -	- - -	- - -
7) Explosions of firedamp or coal dust	1 4 8	- - -	2 - 33	- - -	- - -	3 4 41
8) Sudden outbursts of firedamp, suffocation of natural gases	- - -	- - -	- - -	- - -	- - -	- - -
9) Underground combustion and fires	- - -	- - -	- - -	- - -	- - -	- - -
10) Inrushes of water	- - -	- - -	- - -	- - -	- - -	- - -
11) Electricity	- - -	- - -	- - -	- - -	- - -	- - -
12) Other causes	- - -	- - -	- - -	- - -	- - -	- - -
TOTAL	1 4 8	- - -	2 - 33	- - -	- - -	3 4 41

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

(N) Number of group accidents.

ANNEX II

**II. COMMON STATISTICAL SUMMARY OF
UNDERGROUND ACCIDENTS AT MINES
IN 1966**

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Germany (Land)
Coal-field: North Rhine/Westphalia
Ruhr

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	1,262	50		4.610	0.182	-	-	-
2) Haulage and transport	558	48		2.039	0.175	-	-	-
3) Movement of personnel	792	28		2.894	0.102	-	-	-
4) Machinery, handling of tools and supports	331	7		1.209	0.026	-	-	-
5) Falling objects	835	11		3.051	0.040	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
7) Explosions of firedamp or coal dust	5	7		0.018	0.026	1	5	7
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.004	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	4	-		0.015	-	-	-	-
12) Other causes	114	9		0.416	0.033	-	-	-
TOTAL	3,901	161	273,699,265	14.252	0.588	1	5	7

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Germany (Land)
North Rhine/Westphalia
Coal-field: Aachen

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	278	17		4.702	0.287	-	-	-
2) Haulage and transport	105	9		1.776	0.152	-	-	-
3) Movement of personnel	153	5		2.588	0.085	-	-	-
4) Machinery, handling of tools and supports	85	4		1.438	0.068	-	-	-
5) Falling objects	176	6		2.977	0.101	-	-	-
6) Explosives and fumes	2	-		0.034	-	-	-	-
7) Explosions of firedamp or coal dust	-	14		-	0.237	1	-	14
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-		-	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	39	1		0.659	0.017	-	-	-
TOTAL	838	56	59,121,691	14.174	0.947	1	-	14

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Germany (Land)
North Rhine/Westphalia
Coal-field:

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	1,540	67		4.627	0.201	-	-	-
2) Haulage and transport	663	57		1.992	0.171	-	-	-
3) Movement of personnel	945	33		2.839	0.099	-	-	-
4) Machinery, handling of tools and supports	416	11		1.250	0.033	-	-	-
5) Falling objects	1,011	17		3.038	0.051	-	-	-
6) Explosives and fumes	2	-		0.006	-	-	-	-
7) Explosions of firedamp or coal dust	5	21		0.015	0.063	2	5	21
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.003	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	4	-		0.012	-	-	-	-
12) Other causes	153	10		0.460	0.030	-	-	-
TOTAL	4,739	217	332,820,956	14.239	0.651	2	5	21

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Germany

Coal-field: Saar

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	216	6		5.510	0.153	-	-	-
2) Haulage and transport	106	8		2.704	0.204	-	-	-
3) Movement of personnel	116	2		2.959	0.051	-	-	-
4) Machinery, handling of tools and supports	47	-		1.199	-	-	-	-
5) Falling objects	206	1		5.256	0,026	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
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	-		0.026	-	-	-	-
TOTAL	692	17	39,196,354	17.654	0.434	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Germany
North Rhine/Westphalia
Coal-field: and Saar

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	1,756	73		4.721	0.197	-	-	-
2) Haulage and transport	769	65		2.067	0.175	-	-	-
3) Movement of personnel	1,061	35		2.852	0.094	-	-	-
4) Machinery, handling of tools and supports	463	11		1.244	0.030	-	-	-
5) Falling objects	1,217	18		3.272	0.048	-	-	-
6) Explosives and fumes	2	-		0.005	-	-	-	-
7) Explosions of firedamp or coal dust	5	21		0.013	0.056	2	5	21
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.002	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	4	-		0.010	-	-	-	-
12) Other causes	154	10		0.414	0.027	-	-	-
TOTAL	5,431	234	372,017,310	14.598	0.629	2	5	21

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Belgium

Coal-field: Charleroi-Namur

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	98	4		4.647	0.190	-	-	-
2) Haulage and transport	71	2		3.367	0.095	-	-	-
3) Movement of personnel	21	1		0.996	0.047	-	-	-
4) Machinery, handling of tools and supports	49	-		2.324	-	-	-	-
5) Falling objects	14	-		0.664	-	-	-	-
6) Explosives and fumes	1	-		0.047	-	-	-	-
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	15	-		0.711	-	-	-	-
TOTAL	269	7	21,087,984	12.756	0.332	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Belgium

Coal-field: Liège

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	57	5		4.385	0.385	-	-	-
2) Haulage and transport	50	1		3.847	0.077	-	-	-
3) Movement of personnel	17	-		1.308	-	-	-	-
4) Machinery, handling of tools and supports	22	-		1.693	-	-	-	-
5) Falling objects	2	-		0.154	-	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
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	1		0.077	0.077	-	-	-
TOTAL	149	7	12,996,744	11.464	0.539	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Belgium
Coal-field: Borinage/Centre

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	59	5		5.453	0.463	-	-	-
2) Haulage and transport	57	1		5.269	0.092	-	-	-
3) Movement of personnel	10	-		0.924	-	-	-	-
4) Machinery, handling of tools and supports	39	-		3.605	-	-	-	-
5) Falling objects	4	-		0.370	-	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	1	-		0.092	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	6	-		0.555	-	-	-	-
TOTAL	176	6	10,818,824	16.268	0.555	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Belgium

Coal-field: South

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	214	14		4.766	0.312	-	-	-
2) Haulage and transport	178	4		3.964	0.089	-	-	-
3) Movement of personnel	48	1		1.069	0.022	-	-	-
4) Machinery, handling of tools and supports	110	-		2.450	-	-	-	-
5) Falling objects	20	-		0.445	-	-	-	-
6) Explosives and fumes	1	-		0.022	-	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	1	-		0.022	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	22	1		0.490	0.022	-	-	-
TOTAL	594	20	44,903,552	13.228	0.445	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Belgium

Coal-field: Campine

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	72	12		2.044	0.341	-	-	-
2) Haulage and transport	84	11		2.384	0.312	-	-	-
3) Movement of personnel	27	1		0.766	0.028	-	-	-
4) Machinery, handling of tools and supports	62	2		1.760	0.057	-	-	-
5) Falling objects	8	-		0.227	-	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.028	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	1	-		0.028	-	-	-	-
12) Other causes	7	-		0.199	-	-	-	-
TOTAL	261	27	35,231,256	7.408	0.766	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Belgium

Coal-field: (Whole country)

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	286	26	-	3.568	0.324	-	-	-
2) Haulage and transport	262	15	-	3.269	0.187	-	-	-
3) Movement of personnel	75	2	-	0.936	0.025	-	-	-
4) Machinery, handling of tools and supports	172	2	-	2.146	0.025	-	-	-
5) Falling objects	28	-	-	0.349	-	-	-	-
6) Explosives and fumes	1	-	-	0.013	-	-	-	-
7) Explosions of firedamp or coal dust	-	-	-	-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	1	1	-	0.013	0.013	-	-	-
9) Underground combustion and fires	-	-	-	-	-	-	-	-
10) Inrushes of water	-	-	-	-	-	-	-	-
11) Electricity	1	-	-	0.013	-	-	-	-
12) Other causes	29	11	-	0.362	0.013	-	-	-
TOTAL	855	47	80,134,808	10.669	0.587	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: France

Coal-field: Nord/pas-de-Calais

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	483	22		3.799	0.172	-	-	-
2) Haulage and transport	208	19		1.636	0.149	-	-	-
3) Movement of personnel	221	2		1.739	0.016	-	-	-
4) Machinery, handling of tools and supports	301	3		2.368	0.024	-	-	-
5) Falling objects	210	2		1.652	0.016	-	-	-
6) Explosives and fumes	1	-		0.008	-	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.008	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	1	-		0.008	-	-	-	-
11) Electricity	-	2		-	0.016	-	-	-
12) Other causes	26	-		0.205	-	-	-	-
TOTAL	1,451	51	127,116,232	11.415	0.401	-	-	-

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a)

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: France

Coal-field: Centre-Midi (excl.
Provence)

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	164	9		4.305	0.237	-	-	-
2) Haulage and transport	91	2		2.389	0.052	-	-	-
3) Movement of personnel	116	-		3.045	-	-	-	-
4) Machinery, handling of tools and supports	206	-		5.408	-	-	-	-
5) Falling objects	85	-		2.231	-	-	-	-
6) Explosives and fumes	1	1		0.026	0.026	-	-	-
7) Explosions of firedamp or coal dust	6	-		0.157	-	1	6	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	-		-	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	13	-		0.341	-	-	-	-
TOTAL	682	12	38,097,256	17.902	0.315	1	6	-

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: France

Coal-field: Lorraine

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	158	13		3.971	0.327	-	-	-
2) Haulage and transport	82	5		2.060	0.126	-	-	-
3) Movement of personnel	122	3		3.065	0.075	-	-	-
4) Machinery, handling of tools and supports	34	-		0.854	-	-	-	-
5) Falling objects	70	1		1.759	0.025	-	-	-
6) Explosives and fumes	1	-		0.025	-	-	-	-
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	2	1		0.050	0.025	-	-	-
TOTAL	469	23	39,798,752	11.784	0.578	-	-	-

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: France

Coal-field: (Whole country excl.
Provence)

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	805	44		3.927	0.214	-	-	-
2) Haulage and transport	381	26		1.858	0.126	-	-	-
3) Movement of personnel	459	5		2.239	0.024	-	-	-
4) Machinery, handling of tools and supports	541	3		2.639	0.015	-	-	-
5) Falling objects	366	3		1.785	0.015	-	-	-
6) Explosives and fumes	2	1		0.010	0.005	-	-	-
7) Explosions of firedamp or coal dust	6	-		0.029	-	1	6	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.005	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	1	-		0.005	-	-	-	-
11) Electricity	-	2		-	0.010	-	-	-
12) Other causes	41	1		0.200	0.005	-	-	-
TOTAL	2,602	86	205,012,240	12.692	0.419	1	6	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Italy

Coal-field: Sulcis

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	9	-		6.360	-	-	-	-
2) Haulage and transport	1	-		0.707	-	-	-	-
3) Movement of personnel	1	-		0.707	-	-	-	-
4) Machinery, handling of tools and supports	10	-		7.067	-	-	-	-
5) Falling objects	-	-		-	-	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
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	9	-		3.360	-	-	-	-
TOTAL	30	-	1,415,608	18.201	-	-	-	-

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS
AT MINES IN THE E.C.S.C. COUNTRIES

Year: 1966
Country: Netherlands

Coal-field: Limburg

C A U S E	Number of casualties		Man-hours worked	Number of disablements as under (a) per million man-hours (to third decimal place)	Number of fatalities as under (b) per million man-hours (to third decimal place)	Group accidents as under (c) below		
	Disablements as under (a) below	Fatalities as under (b) below				Number of accidents	Number of disablements as under (a)	Number of fatalities as under (b)
1) Falls of ground	67	2		1.688	0.050	-	-	-
2) Haulage and transport	104	5		2.621	0.126	-	-	-
3) Movement of personnel	24	-		0.605	-	-	-	-
4) Machinery, handling of tools and supports	82	1		2.066	-	-	-	-
5) Falling objects	38	-		0.958	-	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
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	14	-		0.353	-	-	-	-
TOTAL	329	7	39,681,352	8.291	0.176	-	-	-

(a) Casualties were unable to resume work below ground for at least eight weeks.

(b) Casualties died within eight weeks.

(c) Accidents involving more than five casualties of type (a).

COMPARATIVE TABLE OF NUMBERS OF PERSONS
 INCAPACITATED BY UNDERGROUND ACCIDENTS FOR EIGHT WEEKS OR LONGER
 IN 1966,
 PER MILLION MAN-HOURS

C A U S E	Germany (Land North Rhine/Westphalia + Saar)	Belgium	France (excl. Provence)	Italy	Netherlands	Community
	1966	1966	1966	1966	1966	1966
1) Falls of ground	4.721	3.568	3.927	6.360	1.688	4.186
2) Haulage and transport	2.067	3.269	1.858	0.707	2.621	2.173
3) Movement of personnel	2.852	0.936	2.239	0.707	0.605	2.320
4) Machinery, handling of tools and supports	1.244	2.146	2.639	7.067	2.066	1.815
5) Falling objects	3.272	0.349	1.785	-	0.958	2.362
6) Explosives and fumes	0.005	0.013	0.010	-	-	0.007
7) Explosions of firedamp or coal dust	0.013	-	0.029	-	-	0.016
8) Sudden outbursts of firedamp, suffocation by natural gases	-	0.013	-	-	-	0.001
9) Underground combustion and fires	-	-	-	-	-	-
10) Inrushes of water	-	-	0.005	-	-	0.001
11) Electricity	0.010	0.013	-	-	-	0.007
12) Other causes	0.414	0.362	0.200	3.360	0.353	0.354
TOTAL	14.598	10.669	12.692	18.201	8.291	13.242

COMPARATIVE TABLE OF ACCIDENTS
 RESULTING IN DEATH WITHIN EIGHT WEEKS
 IN 1966,
 PER MILLION MAN-HOURS

C A U S E	Germany (Land North Rhine/Westpha- lia + Saar)	Belgium	France (excl. Provence)	Italy	Netherlands	Community
	1966	1966	1966	1966	1966	1966
1) Falls of ground	0.197	0.324	0.214	-	0.050	0.208
2) Haulage and transport	0.175	0.187	0.126	-	0.126	0.160
3) Movement of personnel	0.094	0.025	0.024	-	-	0.060
4) Machinery, handling of tools and supports	0.030	0.025	0.015	-	-	0.023
5) Falling objects	0.048	-	0.015	-	-	0.030
6) Explosives and fumes	-	-	0.005	-	-	0.001
7) Explosions of firedamp or coal dust	0.056	-	-	-	-	0.030
8) Sudden outbursts of firedamp, suffocation by natural gases	0.002	0.013	0.005	-	-	0.004
9) Underground combustion and fires	-	-	-	-	-	-
10) Inrushes of water	-	-	-	-	-	-
11) Electricity	-	-	0.010	-	-	0.003
12) Other causes	0.027	0.013	0.005	-	-	0.017
TOTAL	0.629	0.587	0.419	-	0.176	0.536

COMPARATIVE TABLE OF UNDERGROUND GROUP ACCIDENTS
(SEE (C) BELOW)
IN 1966

C A U S E	Germany (Land North Rhine/Westpha- lia + Saar)	Belgium	France (excl. Provence)	Italy	Netherlands	Community
	N a b	N a b	N a b	N a b	N a b	N a b
1) Falls of ground	- - -	- - -	- - -	- - -	- - -	- - -
2) Haulage and transport	- - -	- - -	- - -	- - -	- - -	- - -
3) Movement of personnel	- - -	- - -	- - -	- - -	- - -	- - -
4) Machinery, handling of tools and supports	- - -	- - -	- - -	- - -	- - -	- - -
5) Falling objects	- - -	- - -	- - -	- - -	- - -	- - -
6) Explosives and fumes	- - -	- - -	- - -	- - -	- - -	- - -
7) Explosions of firedamp or coal dust	2 5 21	- - -	1 6 -	- - -	- - -	3 11 21
8) Sudden outbursts of firedamp, suffocation by natural gases	- - -	- - -	- - -	- - -	- - -	- - -
9) Underground combustion and fires	- - -	- - -	- - -	- - -	- - -	- - -
10) Inrushes of water	- - -	- - -	- - -	- - -	- - -	- - -
11) Electricity	- - -	- - -	- - -	- - -	- - -	- - -
12) Other causes	- - -	- - -	- - -	- - -	- - -	- - -
TOTAL	2 5 21	- - -	1 6 -	- - -	- - -	3 11 21

- (a) Casualties were unable to resume work below ground for at least eight weeks.
(b) Casualties died within eight weeks.
(c) Accidents involving more than five casualties of type (a).
(N) Number of group accidents.

III. REPORT ON THE IMPLICATIONS OF PAYMENT
AT PIECE RATES FOR MINE SAFETY
(adopted by the Mines Safety and Health
Commission at its plenary session of
5-6 May 1966)

INTRODUCTION

The piecework systems here referred to are arrangements whereby miners' pay is directly, and in principle entirely, governed by production, performance or productivity.

They are known by different names in the different countries: in Germany the generic term in respect of underground operations is "Gedinge", in Belgium and France "travail à marché" or "travail à la tâche", and in Italy "salario a cottimo". In the Netherlands the expression "accoord" was used up to 1 June 1962; after that a new system was introduced, which is dealt with in detail below.

It is not only in name, however, that the arrangements vary: there are a number of other differences which will be described in the pages following, together with some characteristic features of particular arrangements specifically referred to in this Report.

As is clear from various publications on the subject, the problem of the bearing of piecework payment on safety is not a new one. Naturally, therefore, it was discussed at several meetings of the Conference on Safety in Coalmines convened in accordance with the ECSC Council of Ministers' resolution of 6 September 1956, and a number of recommendations were drawn up on the matter. Reference is made in the present Report to some of these: the Working Party is not, however, concerned to express any opinion concerning their value as such, but rather to examine the problem further, basing itself on the approach then adopted, but at the same time, since that approach was of course partly conditioned by the circumstances of 1956, also taking into account such changes as have supervened meantime.

While the bearing of piecework payment on safety is a problem that is still with us, its extent and form depend on a variety of factors. In the course of the Working Party's meetings, members have drawn attention, inter alia, to the contrasts that arise in this respect when business is good and when it is bad. The point has also been made that the choice of the piecework arrangement adopted is likely to be influenced by the degree of mechanization obtaining (1), and furthermore that increasing mechanization can alter the nature of problems formerly arising out of piecework in general or a particular kind of piecework (see p.53, "Changes resulting from mechanization"). This is an aspect on which we have thought it well to lay particular stress, in view of the strides made in mechanization in the last few years, which the Safety Conference was not able to take fully into account. Then again, it is necessary to bear in mind the social trend that is still in progress, whereby, generally speaking, workers have become more and more set on securing a stable income: this too has not been without its effects on piecework systems. All these aspects are touched upon in the pages following.

To avoid any misunderstandings, we would make it clear that no attempt could be made to analyze the practical application of every piecework arrangement in every country, coal-field and colliery; what we have sought to do is to bring out the differences as among these arrangements and the main features of their application.

In the discussions, the workers' representatives repeatedly voiced their objections to piecework, arguing that under present-day conditions, with all the technological improvements that have been introduced at workplaces, it is out of date and increasingly uncalled-for now that workers are achieving emancipation. Other members, however, did not agree.

(1) I.e. mechanization of winning, loading and movement of equipment. Only in a handful of cases have support and certain transport operations so far been mechanized, so that there is here no question of full underground mechanization.

The Working Party accepted that the object of piecework arrangements is to stimulate workers' performance. Now of their nature such arrangements, whatever their precise form, are liable to present in practice certain safety problems, and the members of the Working Party accordingly felt they should propose certain measures they considered would make for greater safety. This they have done even though, as was frequently found, it cannot actually be proved from the accident returns how far safety is adversely affected by piecework, if at all. There is in fact no evidence of any effect, adverse or beneficial, since usually the accident returns do not specify whether the operations concerned were being done on a piecework basis; in addition, as has been pointed out, it is not really possible to establish statistically the existence of a hazard resulting from piecework, inasmuch as occupational safety, absence due to accident and the length of such absence are influenced by a great many factors.

The present Report embodies all points from the Working Party's memoranda and discussions which are regarded as important under its terms of reference.

As noted above, the Conference on Safety in Coal-mines adopted a number of recommendations concerning piecework: although these refer, according to language, to "Gedingelohn", "salaire à la tâche", "salario a cottimo" and "accoordloon", it is clear that in all cases the reference is to the arrangements here termed "piecework".

I. FACTORS INFLUENCING THE DEVELOPMENT OF THE CONCEPT OF PIECEWORK

a) Report of the Conference on Safety in Coal-mines

"An analysis of the manner in which the concept of piecework has developed, and of the place which it has come to take in the wage structure as a whole, reveals that this development has been influenced by economic and technical factors and by a concern for safety. The economic and technical factors include the growth of mechanization and the increased importance to the colliery manager of co-ordinating the tempo of work in the various sectors of the enterprise: as a result of these, the piecework system has in a number of instances been dropped or substantially cut. Another factor is the change in production methods, which has affected the types of piecework (by individuals, by small teams, by large teams). Concern for safety is due to apprehension lest piece rates, particularly as applied in some cases, should place the stress on output to such an extent that the men might be encouraged to take risks or to overwork themselves to the detriment of safety."

b 1) Changes resulting from mechanization

The switch to mechanized operation below ground, now well advanced, is having a notable impact on the piecework systems employed and the various forms in which they are organized. In mechanized workings the miner's duties are not the same as they were in the past, when he hewed part of the seam himself with manual tools and had also to do all the other jobs involved. The factors determining production were then the geological conditions obtaining and the men's own diligence, stamina, physical strength and so on: now, what primarily determines production is the technical installations. At the same time the smooth operation of these depends largely on the care with which they are serviced and handled by the men responsible. This is particularly apparent with concentrations of workplaces.

It can be argued that the earlier piecework systems, instituted to raise the output of individual miners or teams working with manual implements, are gradually ceasing to be suitable for application in mechanized workings, and consequently many members of the Working Party are of the opinion that the whole basis of these systems needs to be changed if they are still to be employed there. In view of the continuing rapid progress of mechanization, it is felt that other modes of payment could well be introduced by stages in their stead.

b 2) The replies to the questionnaire indicate that at the beginning of 1963 one-man piecework ("Einmanngedinge", "tâche individuelle") was still quite usual in fully mechanized workings in some countries.

Although it was noted that this category also covered cases where there was in fact only one man on the job ("Einmannbelegung"), it might reasonably have been expected that a different mode of payment would have been adopted in such workings. To explain the retention of one-man piecework there, it should be recalled that certain operations, such as propsetting and -drawing, often lend themselves to piece payment; moreover, even in mechanized workings some of the coal is often brought down manually with the pick, and while the amount so won is admittedly much smaller than that mined by machine, nevertheless it has in many cases been considered reasonable to continue the one-man piecework arrangements.

One-man piecework is also still sometimes the practice in preparatory work and stone-drifting, even where highly mechanized, and, occasionally, in a variety of other operations.

c) Changes on the social side

In addition to the changes resulting from mechanization, there have in many countries been changes from the social standpoint. Though not equally marked everywhere, these have in general had the twofold effect that

- the workers are more and more anxious to enjoy a steady income;
- means have been devised to obviate unduly large disparities in pay for similar work.

Now it must be borne in mind that in piecework the unit rate of pay does, in principle, differ. On the other hand, those paid at piece rates also receive various bonuses, supplements and allowances to bring the total wage to a given amount. As a result of these arrangements, piecework in such cases has become more and more a device to ensure a given pay level.

In this connection it is perhaps worth briefly running over developments on the social side in two countries.

- 1) In Germany, "Lohnabkommen" (wage agreements) form a major category in the complex of pay arrangements as a whole. They have been steadily increasing in number in the last few years; in 1962 they covered 32 % of all piece-paid workers.

They are rated in Germany as piecework systems, but are actually arrangements whereby a time wage is agreed with the workers, its level to be governed by the type of job concerned and the pay the men would have been entitled to, had they been under a piecework contract.

"Lohnabkommen" are concluded, for example, when the work is not suitable for payment at piece rates and a piecework contract is not possible.

- 2) In the Netherlands a new pay system for under ground workers was introduced on 1 June 1962; as subsequently amended with effect from 1 January 1964, its main features are as follows (1):

- I. A fixed basic wage for the different types of work below ground.

- II. A job allowance ("taakpremie") to encourage conscientious work, calculated in proportion to the basic wage. The average for the underground labour force of a given colliery should work out at about 10 %; above 10 % the allowance goes up by a maximum of 1/2 % for every additional 1 % of productivity.

- III. A productivity bonus for face workers

- a) Bonus per face (or preparatory or drifter's) shift

For every 1 % of extra daily output averaged over a month beyond that needed to qualify for the 10 % job allowance, workers receive a productivity bonus of 1/2 %.

- b) General bonus

Workers engaged in actual winning can also qualify for a general bonus, payable when the effective average daily rate of advance at all faces in a pit exceeds the regular average. The effective advance is calculated in per cent of the regular average and weighted, i.e. divided by the total number of shifts worked. Teams which have not in fact achieved the regular average are treated for the purposes of this calculation as having done so. Again, the general bonus is 1/2 % of the basic wage per 1 % of effective extra daily advance.

- IV. Allowances for specified jobs at the face

Charge hands, hewers, hewer's mates and apprentice hewers receive a fixed allowance per shift worked for a number of specified jobs.

- V. Allowances for other jobs

Certain categories of workers receive an allowance per shift worked, calculated in per cent of their basic wage, according to the nature of the job concerned.

(1) For further particulars see Docs. Nos. 6689/62 and 1603/64, supplied by Mr. J. Palmen.

VI. Longevity allowance ("dienstjarenrente")

This is paid to former face workers who after long service at the face have now been permanently assigned to lower-paid jobs, or have left the colliery altogether. To be entitled to it they must

- 1) have been employed below ground for a specified number of years before their transfer or departure;
- 2) have during the five years immediately preceding their transfer or departure worked actually at the face for at least two-thirds of the time.

The allowance consists of 1 % of the former wage for each full year of service after the tenth year below ground.

VII. Attendance bonus ("aanblijfpremie")

For every 400 shifts worked under consecutive contract at a colliery since 1 January 1964, the worker is entitled to a single lump bonus. The bonus is largest for the men engaged in the specified jobs at the face referred to in IV above.

As can be seen, whereas under the earlier piecework systems a substantial portion of the wage varied, this is no longer so under the new arrangement described above.

II. BASIC PRINCIPLES

Procedure for establishing piecework arrangements

Piecework arrangements can be arrived at in two ways, roughly as follows:

- 1) The norms and rates are negotiated by the management's and men's representatives in the working itself. If agreement is reached, the terms must be recorded in writing in the so-called "piece contract" ("Gedingevertrag", "contrat de tâche"), a copy of which, the "piece sheet" ("Gedingeschein", "feuille de tâche"), is given to the workers' representatives. Provision to this effect, and also as to certain other relevant points, such as the right to reject the norms and rates proposed, is contained in the collective agreement and the colliery regulations.
- 2) The norms and rates are fixed by the supervisory personnel, in some cases on the basis of schedules drawn up in accordance with specialist studies. Management/labour negotiations are dispensed with.

The majority of the Working Party emphasized that they considered two principles of the utmost importance, as serving to ensure that the men did not feel either that the norms were imposed on them or that excessive amounts of work were required of them; were either of these impressions to be created, members thought it very possible that safety standards would suffer. The principles were

- a) the right to have the norms and rates negotiated between the management's and men's representatives;
- b) the right, should agreement not be reached in such negotiations, to refuse the proposed norms and rates without this affecting the men's existing terms of employment.

The members further felt that the men must be able to negotiate without any sense of moral pressure being brought to bear on them. There must be payment arrangements assuring them of a fair wage in any case, even if negotiations proved abortive, since if this were not so they would have no option but to accept norms they regarded as unreasonable, in order not to forfeit quite a substantial slice of their income.

It was unquestionably necessary, in the Working Party's view, that there should be a definite time-limit for reaching agreement, beyond which the matter should be treated as a full-scale dispute.

Factors in the calculation of piece rates

Piece rates are basically calculated from output, though other considerations are often also taken into account.

As regards operations of particular importance to safety, we may distinguish between two types of piecework arrangement:

- 1) those where safety operations are a separate item, paid separately;
- 2) those where they are an integral item taken into account in the fixing of the rates.

Separate payment of safety work

If a man has for instance to spend some time setting extra supports, his pay will not suffer: all the unitary times are fixed by the same rules, irrespective of the type of work done, so that the value per time unit is identical. A workman who has been engaged in propsetting for most of his shift will therefore be paid the same as if he had spent the same time in winning or loading; consequently he has no inducement to produce more and skimp the safety side.

Inclusive payment of safety work

The supervisory personnel are responsible for seeing that the regulation safety precautions are observed. In some cases, the men are penalized for non-observance; on the other hand, if they have carried out necessary safety operations not actually demanded of them by the regulations, they may receive a bonus calculated on the same basis as the rates for the regulation safety work. This arrangement may be applied by concluding agreements laying down both the output and the other duties required of the men, copies of such agreements being retained by the latter.

The general view of the Working Party was that the men concerned should be given a full list of the operations to be carried out. This would obviate misunderstandings and differences of opinion both among the workmen and between them and the deputies and overmen, which if allowed to develop could easily be prejudicial to safety.

Most of the Working Party considered that the second type of arrangement might encourage the men, or some of them, to concentrate principally on output, in order to earn more, and so devote insufficient time and care to safety. It was pointed out that to them the main thing was output and the pay going with it, especially under certain kinds of piecework system.

Members also felt it to be important that the agreements should specifically mention that the need to work with all due attention to safety requirements had been taken into account in drawing them up, in case the men formed the idea that output had been the only consideration that counted.

Attention was drawn in this connection to the responsibilities of the colliery management and of the supervisory personnel (cf. p. 59). The Working Party thought it well to point out, at the same time, that under both types of piecework arrangement it was particularly important for managerial and supervisory staff to make sure that the safety operations were properly carried out.

Piecework

Piecework means, basically, the achievement of a given output in a given time, entitling to a given wage; it is expected, however, that the output will in fact be higher, in which case the wage will be higher also.

Now, sometimes the mode of calculation is such that it may be wondered whether the effect is not to create problems for the men. With a single exception, output ceilings are nowhere imposed, either directly or indirectly, so that there is no maximum wage; in one country indeed the fixing of a maximum wage is actually prohibited. This state of affairs, in the view of some members, can involve risks to the safety, and even the health, of the men concerned, more especially in the case of certain types of piecework, namely those on a one-man basis ("Einmanngedinge", "tâche individuelle"). These members consider that the men's keenness to earn as much as possible, and accordingly to step up their output, is influenced not only by their particular skills and general physical condition, but also by other considerations such as financial obligations to be met, debts to be paid and so on. The members in question further feel that one-man piecework presents an additional safety and health hazard inasmuch as it does undoubtedly lessen the indispensable sense of team spirit by encouraging each man to seek his own advantage at the expense of the rest. They therefore condemn the failure to impose output and wage ceilings for one-man piecework.

As regards group piecework ("Kameradschaftsgedinge", "tâche collective"), where each man's wage is calculated from the output of the team as a whole, they consider it at any rate undesirable to have no ceiling. They left it to the Working Party, however, to establish just how much less risk is involved by group than by one-man piecework.

Cases were quoted in which workmen, anxious to earn as much as they possibly could, have specially asked to be assigned a panel which they could not conceivably bring down completely in the course of an ordinary shift, even by working their hardest. Members recalled substantial disparities in pay (consequent on disparities in output), occasions when overtime had had to be worked to finish the normal stint, and

cases of bad feeling among workmen over differences in earnings. The point was also made that the less physically powerful men, wishing to earn the same as the more powerful, might be tempted to overtax their strength, with consequent risks to their safety and health.

The members who took this stance proposed that the Working Party pass a recommendation to the effect that, in fixing the output norm, account should be taken of the effective working time represented by a shift and of the amount of effort that could reasonably be expected of the men during that time in the light of the particular working conditions concerned.

Over against the view that output and pay ceilings should be imposed, other members contended that this would be difficult to do given the special character of piecework arrangements as such. While not disputing the hazards to which attention had been drawn, they maintained that, were such ceilings to be fixed, these could come to be regarded as norms, and therefore urged that the inherently dangerous types of piecework, viz. the one-man piecework systems, should be done away with altogether.

One member mentioned the system employed in his country, under which operations of particular importance from the safety standpoint were paid separately: this meant that the men knew they could devote all the necessary time to such operations without a drop in their pay. A considerable number of other members applauded this principle, and asked that it should be borne in mind in preparing draft recommendations.

Some members pointed out that, with the steady trend towards larger workings, group piecework was becoming more and more the rule. They proposed that the Working Party recommend its still more extensive introduction, especially for large workings and for workings where several teams were employed together. One-man piecework would then be confined to cases where it really was peculiarly suited to the operations concerned; where group piecework was feasible, one-man piecework should be excluded.

Unexpected difficulties

See p. 126 of the Safety Conference Report, item e):

" To ensure that no workers are obliged by unexpected difficulties to over-tire themselves or to take additional risks for fear of otherwise losing too large a sum of their wages, there should be laws or collective-bargaining agreements specifying the conditions for payment of a minimum wage. "

It was noted that unexpected difficulties could

- 1) necessitate operations which could be performed on a piecework basis;
- 2) necessitate operations which could not be performed on a piecework basis, in which case the men's pay must be computed according to special rules;
- 3) necessitate radical changes in the organization of the workplace, in which case the piecework calculations would have to be changed also.

It was proposed to treat as "unexpected difficulties" all those which could not be foreseen at the time when the piece rates were fixed.

The point was made that any such difficulties must be accepted as genuine ones by the men also: consequently no piecework arrangement could be terminated ahead of schedule or amended until difficulties had been agreed to exist by the management's and men's representatives.

The Working Party noted that in one particular country the men were entitled, in the event of a radical change in the working conditions, to insist on the amendment or termination of the piecework arrangements forthwith, whereas management could do so only with effect from the end of the month. In the view of members this principle should be recommended for application at all mines.

As regards the minimum wage to be paid in the event of unexpected difficulties, the Working Party considered this should be fairly proportioned to the piece rates proper, since otherwise the men would be tempted to make sure of their earnings by driving themselves harder, working overtime and taking greater risks.

Performance in piecework

As the performance figures are reflected in the wages paid, they are of importance to the men concerned as well as to management.

The Working Party noted that problems were liable to arise in practice in establishing what the men's output had in fact been. In some countries the output and the pay drawn for it have to be checked at regular intervals and the findings announced. This is done partly because the men have a right to know how their performance is rated, and also as a means of preventing uncertainty, speculation, disappointment and hence dissatisfaction, all tending to have adverse effects on safety. It is desirable moreover that the men or their representatives should at the same time be given details of any additions or deductions affecting the final wage figure, and of the mode of calculation.

The Working Party felt it was not enough simply to see to it that everything necessary was done to ensure that the men were paid fairly: there should be something more. Since it is a matter of great importance to the men that they should be able to work out their pay themselves from their own knowledge of what has been done, the Working Party decided to propose a recommendation that the mode of calculation for piecework should be sufficiently simple for any miner to reckon up at any time what pay he ought to have earned in a given period, and to check whether he has in fact received that pay.

Minimum and maximum ages for employment on piecework

Since only workers with appropriate training are allowed to do piecework, there is ipso facto a minimum age below which piecework is prohibited. This is important partly because juveniles do not yet have the physical strength to do really heavy work, and partly because piecework demands a definite mental adjustment which has also to be taken into account. In almost all countries, therefore, the regulations forbid it in the case of workers below a certain age.

The Working Party, having examined a number of mining regulations on this point, unanimously agreed to recommend that no person should be permitted to do piecework before reaching the age of 18. At the same time, it was recognized that in fixing such a limit, account would need to be taken in each country of the minimum age laid down for admission to underground duties in general. Care should also be taken to see that the performance-linked portion of young miners' wages was initially kept limited, and increased only by degrees. To allow for other possible factors, the Working Party decided to recommend that workers should be medically examined before being assigned to piecework.

It was not felt particularly desirable to recommend that piecework should also be prohibited for men over a specified age, since the operations involved could be of many different kinds, and moreover two men of the same age could be in completely contrasting states of physical fitness. On the other hand, the Working Party thought it well to recommend that all miners employed on piecework be medically examined at regular intervals to see whether they were in fact still fit for it.

Change-over from piece to time rates

As a rule, men going over from piece to time rates find their income appreciably reduced; in some countries this can also mean a smaller pension. It was pointed out that, for fear of such a development, workers might try to go on with piecework longer than they should. This was no doubt mainly a problem in the countries where there were no regulations on the subject.

One aspect of this, obviously, many-sided question which particularly engaged the Working Party's attention, was the need to devise means of making up as far as possible the difference between the wage earned on piecework and the wage earned

at time rates by men no longer able to carry on at piecework. Most members were in favour of recommending arrangements of this kind, as they considered this would greatly ease the transition from the one to the other, and so ensure that the men concerned did not endanger health and safety by overworking.

Responsibilities of managerial and supervisory personnel

See p. 127 of the Safety Conference Report, item 10:

"It is recognized that piecework necessitates particular alertness to safety on the part of the supervisory staff. The training and rates of pay of the supervisory staff should be specially fixed to allow for this."

"Where one of the men is given special responsibilities for a team in regard to safety, the piece rates paid him must make allowance for the time he has to spend on safety duties."

The Working Party strongly emphasized that the management and the supervisory personnel appointed by it must be considered answerable for the running of workings, including workplace organization, conduct of operations and safety. It was explicitly added that this responsibility was in no way lessened by the colliery's possession of a special safety department.

Managerial and supervisory staff must recognize that there was no conflict between emphasis on output and profitability and emphasis on safety. In view of the special features of piecework, the Working Party felt that this was a point needing to be specially stressed. Attention was drawn to the fact that in workings where the men were employed at piece rates particular care needed to be devoted to safety, and that it was important to see that no one supervisor had too extensive a range of duties. Supervisors must be in a position to do their job as thoroughly as possible: accordingly they must not be asked to take on more than the absolute minimum of administrative and para-administrative work, so that they could give full attention to the general working environment, any deterioration in which was quite as liable as any other factor to endanger safety.

Payment of supervisory staff

See p. 125 of the Safety Conference Report, items 5 and 6:

"The pay of the supervisory staff should be fixed in such a manner as to enable them to bear their full share of responsibility regarding safety without suffering any disadvantage in regard to their wages."

"The workers' representatives submitted a joint proposal to the effect that supervisors should not be concerned in any way with production; the French employers' representatives considered that supervisors should concern themselves both with the output of the men under them and with safety."

The Working Party discussed the mistaken approach referred to in the preceding Section, that of treating superintendence of output and superintendence of safety as two separate matters. For the record, it was once more emphasized that the managerial and supervisory personnel were responsible both for workplace organization and conduct of operations and for the safety of the men on the job.

The mistake might well, it was felt, have arisen out of arrangements whereby supervisors' pay too was governed, wholly or in large part, by the output achieved. The Working Party was firmly of the opinion that the direct linking of supervisors' pay to output levels was deleterious to safety. Accordingly, if output and performance bonuses were paid, corresponding safety bonuses should be paid also.

As we noted on a previous page, the effect of the general trend in progress on the social side is to make the men more and more set on earning a steady and gradually rising income. Some members of the Working Party observed that this was coming to be increasingly the case with supervisory personnel also, and the comment was offered that it would aid good labour relations if some of the wage items which are at present variable were incorporated in the regular wage instead.

Attention was drawn to the considerable influence supervisors could have on the men's team spirit and general temper, another point of some relevance to safety.

While the personnel with general supervisory duties are required to oversee both safety and production, there are of course also special safety deputies as well. The Working Party considered it important that the two categories should be independent of one another.

Settlement of disputes

In some countries, there are special bodies or procedures for handling disputes. One of these, the Conciliation Board ("Gedingekommission" or "commission de conciliation"), deals with piecework cases. The parties entitled to submit disputes to it are designated in collective-bargaining agreements.

Disputes relate as a rule to

- 1) the piece rates, norms, etc., proposed in efforts to agree a contract;
- 2) changes occurring in working conditions after the conclusion of the contract;
- 3) termination of the contract.

It is of course of the utmost importance that the men should work with a will. In the view of many members, the very fact that there is a body to which disputes can be referred tends to make for fewer disputes: its existence, they consider, encourages the management's and men's representatives to negotiate in good faith and accept a fair compromise.

These members feel it to be most important that the men should not receive the impression that the piecework arrangements and any action taken to alter or terminate them have been imposed from above: were they to do so, they might carry out the work without really caring about it as they should, which could have prejudicial consequences for safety.

It was urged by many members that there should be a conciliation board, of the kind described, in every country, and not only in those where piecework is done under contracts concluded between the management's and men's representatives. An equal number of seats on such bodies should be allotted to the workers' and the employers' representatives; their composition and rules of procedure, the rights and obligations of their members, the procedure for making their findings known and the rules as to compliance with these should be laid down in collective agreements. It is also considered that the men's earnings should not be allowed to suffer to any appreciable extent while disputes are pending.

Some members, however, felt that the institution of bodies of this kind was not necessary in their countries for the settlement of disputes.

The Working Party was not able to go into the safety aspects of advancing mechanization and social change. It considered these should be more fully examined, with reference in particular to

- the desirability of altering the basis of the piecework arrangements now current;
- the desirability of devising new pay arrangements taking account of these developments, and designed
 - to be proportionate to quality of performance rather than to quantity of output;
 - to promote co-operation and team spirit within each group of workmen;
 - to reduce substantially, or altogether do away with, variability in wages for men in the same grade.



Annex IV

IV. RECOMMENDATIONS AS TO PRINCIPLES TO BE OBSERVED IN VIEW OF THE
POSSIBLE INFLUENCE OF PAYMENT AT PIECE RATES ON SAFETY IN
COAL-MINES

- based on Annex III -
(adopted by the Mines Safety and Health Commission at its
Plenary Session on 5-6 May 1966)

Whereas

- piecework, by linking wages to output, encourages miners to concentrate on the latter to an extent which can in certain cases cause them to act without due regard for safety,

the Commission hereby RECOMMENDS as follows:

1. Piecework arrangements

1.1 Minimum age; medical examinations

1.1.1 To be assigned to piecework, a miner must

- be not less than 18 years of age;
- have undergone a medical examination to establish his fitness for such work.

1.1.2 Similar examinations must follow at regular intervals.

1.2 Make-up of piece rates

1.2.1 Written particulars of the operations to be performed must be given to the men concerned, including such information as is needed to calculate the amount payable therefor.

1.2.2 In the interests of safety, the piecework arrangement employed must either

- provide that operations of importance to safety shall be paid on a separate basis, or
- contain equivalent financial safeguards for the proper execution of such operations.

1.2.3 In the event of its being found necessary to carry out safety operations not expressly provided for, this must not be allowed to affect the pay of the man or men concerned.

1.3 Fixing of norms and of rates payable therefor

1.3.1 The men must have the right to discuss the fixing of piecework norms and rates with management.

1.3.2 If agreement is not reached, the men or their representatives must have the right to start conciliation proceedings under 4 below.

1.4 Forms of piecework

1.4.1 One-man piecework should preferably be permitted only where the operations concerned are not of a nature to allow of any other form of piecework.

1.5 Determination of the norm

1.5.1 The norm must be determined in accordance with

- the amount of time actually available during a normal shift;
- the amount of work the men can fairly be expected to perform during this time, having regard to the working conditions;
- the amount of time required to perform the operations properly.

1.6 Calculation of the end wage

1.6.1 The basis and mode of calculation must be sufficiently simple for any miner to be able to work out for himself the sum due him for a given period.

1.7 Performance in piecework

- 1.7.1 Regulations should be laid down requiring that periodic checks be carried out on the amounts of work performed for the purpose of determining the wages payable therefor, and that the findings be duly notified to the men concerned.
- 1.7.2 Particulars must be supplied to the men of all additions and deductions affecting the amount of the end wage, together with details as to how these were calculated.

2. Changes in conditions at the workplace

- 2.1 A piecework arrangement may be terminated or amended if management and men are agreed that genuine difficulties warranting this course have been objectively found to exist. Failing such agreement, the men must have the right to ask nevertheless that the arrangement be terminated or amended forthwith.
- 2.1.1 If the men cannot be paid at piece rates for so long as the difficulties persist, they must be paid a proper wage appropriate to their grade.

3. Managerial and supervisory personnel

- 3.1 In the interests of safety, extra supervision must be provided in workings where men are employed on piecework.
- 3.1.1 Since failure to carry out safety operations in good time can result in particular hazards, the supervisory personnel must give the men strict instructions to the necessary effect, and check regularly to see that these are carried out.

3.2 Payment of managerial and supervisory personnel

- 3.2.1 Since managerial and supervisory personnel are responsible not only for the organization and conduct of operations but also for the safety of the men engaged in them, they should as a rule be paid on a basis independent of the ups and downs of production.

They may be granted production or output bonuses provided they have at the same time a sufficient financial incentive to devote the necessary attention to safety.

4. Settlement of disputes

- 4.1 There should be a conciliation system for dealing with any disputes arising between management's and men's representatives with regard to piecework arrangements or their implementation.
- 4.1.1 The conciliation system should operate by means of a board on which employers and workers are equally represented, and which should approach disputes in the light of the present recommendations.
- 4.1.2 The fact that proceedings of this kind are pending must not affect the terms of employment of the men concerned, who must continue to be entitled to a fair wage appropriate to their grade.

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AND ITS WORKING PARTIES AND EXPERT COMMITTEES**

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INTERNATIONAL LABOUR ORGANIZATION, GENEVA

An ILO representative sitting as an observer

B. RESTRICTED COMMITTEE

Consists of the Government members of the Commission

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