COMMISSION OF THE EUROPEAN COMMUNITIES

FIFTH REPORT OF THE MINES SAFETY AND HEALTH COMMISSION

ANNEXES

OCTOBER 1968

COMMISSION OF THE EUROPEAN COMMUNITIES

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ANNEX I

COMMON STATISTICAL SUMMARY OF UNDERGROUND ACCIDENTS AT MINES IN 1967

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

Year: 1967
Country: Germany (Land North Rhine/Westphalia)
Coal-field: Ruhr

CAUSE	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
1) Falls of ground	985	41		4.54	0.19	-	-	-
2) Haulage and transport	383	29		1.77	0.14	-	-	-
3) Movement of personnel	675	18		3.11	0.08	-	-	-
4) Machinery, handling of tools and supports	248	5		1.14	0.02	-	-	-
5) Falling objects	816	16		3.76	0.08	-	-	-
6) Explosives and fumes	5	-		0.02	-	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	2	1		0.01	-	-	-	-
12) Other causes	91	5		0.42	0.02	-	-	-
TOTAL	3 205	116	216 908 597	14.770	0.53	-	-	-

(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: 1967
Country: Germany (Land North Rhine/Westphalia)
Coal-field: Aachen

CAUSE	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
1) Falls of ground	215	13		4.246	0.257	1	-	5
2) Haulage and transport	98	7		1.936	0.138	-	-	-
3) Movement of personnel	138	4		2.725	0.079	-	-	-
4) Machinery, handling of tools and supports	53	-		1.047	-	-	-	-
5) Falling objects	133	2		2.627	0.040	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	1	-		0.020	-	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	28	-		0.553	-	-	-	-
TOTAL	666	26	50 631 248	13.154	0.514	1	-	5

(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: 1967
Country: Germany
Coal-field: Saar

CAUSE	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
1) Falls of ground	160	8		4.834	0.242	-	-	-
2) Haulage and transport	94	9		2.840	0.272	-	-	-
3) Movement of personnel	81	1		2.447	0.030	-	-	-
4) Machinery, handling of tools and supports	37	1		1.118	0.030	-	-	-
5) Falling objects	146	1		4.411	0.030	-	-	-
6) Explosives and fumes	-	-		-	-	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	-	1		-	0.030	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	-	-		-	-	-	-	-
TOTAL	518	21	33 096 329	15.651	0.634	-	-	-

(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: 1967
Country: Germany
Coal-field: Rhine/Westph.and Saar

CAUSE	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		
	Disable-ments as under (a) below	Fatal-ities as under (b) below				Number of acci-dents	Number of dis-ablements as under (a)	Number of fatal-ities
1) Falls of ground	1 360	62		4.524	0.206	-	-	-
2) Haulage and transport	575	45		1.913	0.150	-	-	-
3) Movement of personnel	894	23		2.974	0.076	-	-	-
4) Machinery, handling of tools and supports	338	6		1.124	0.020	-	-	-
5) Falling objects	1 095	19		3.642	0.063	-	-	-
6) Explosives and fumes	5	-		0.017	-	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	1	2		0.003	0.007	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	2	1		0.006	0.003	-	-	-
12) Other causes	119	5		0.396	0.017	-	-	-
TOTAL	4 389	163	300 636 074	14.599	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: 1967
Country: Belgium
Coal-field: Borinage/Centre

CAUSE	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
1) Falls of ground	57	1		6.634	0.116	-	-	-
2) Haulage and transport	33	2		3.841	0.233	-	-	-
3) Movement of personnel	6	-		0.698	-	-	-	-
4) Machinery, handling of tools and supports	32	-		3.725	-	-	-	-
5) Falling objects	9	-		1.048	-	-	-	-
6) Explosives and fumes	3	-		0.349	-	-	-	-
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		-	0.233	-	-	-
TOTAL	140	5	8 591 480	16.295	0.582	-	-	-

(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: 1967
Country: Belgium
Coal-field: Charleroi/Namur

CAUSE	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
1) Falls of ground	91	10		5.361	0.589	-	-	-
2) Haulage and transport	61	1		3.593	0.059	-	-	-
3) Movement of personnel	23	-		1.355	-	-	-	-
4) Machinery, handling of tools and supports	54	1		3.181	0.059	-	-	-
5) Falling objects	6	-		0.353	-	-	-	-
6) Explosives and fumes	1	-		0.059	-	-	-	-
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	1		0.884	0.059	-	-	-
TOTAL	251	13	16 975 000	14.786	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: 1967
Country: Belgium
Coal-field: Liège

CAUSE	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
1) Falls of ground	41	3		3.760	0.275	-	-	-
2) Haulage and transport	43	3		3.943	0.275	-	-	-
3) Movement of personnel	15	-		1.376	-	-	-	-
4) Machinery, handling of tools and supports	25	-		2.293	-	-	-	-
5) Falling objects	4	-		0.367	-	-	-	-
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	-		0.183	-	-	-	-
TOTAL	130	6	10 904 368	11.922	0.550	-	-	-

(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: 1967
Country: Belgium
Coal-field: South

CAUSE	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
1) Falls of ground	189	14		5.182	0.384	-	-	-
2) Haulage and transport	137	6		3.756	0.165	-	-	-
3) Movement of personnel	44	-		1.206	-	-	-	-
4) Machinery, handling of tools and supports	111	1		3.044	0.027	-	-	-
5) Falling objects	19	-		0.521	-	-	-	-
6) Explosives and fumes	4	-		0,110	-	-	-	-
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	17	3		0.466	0.082	-	-	-
TOTAL	521	24	36 470 848	14.285	0.658	-	-	-

(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: 1967
Country: Belgium
Coal-field: Campine

CAUSE	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
1) Falls of ground	88	5		2.480	0.141	-	-	-
2) Haulage and transport	76	7		2.142	0.198	-	-	-
3) Movement of personnel	21	-		0.592	-	-	-	-
4) Machinery, handling of tools and supports	52	1		1.465	0.028	-	-	-
5) Falling objects	14	-		0.395	-	-	-	-
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	-	1		-	0.028	-	-	-
12) Other causes	3	-		0.084	-	-	-	-
TOTAL	254	14	35 481 880	7.158	0.395	-	-	-

(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: 1967
Country: Belgium
Coal-field: (whole country)

CAUSE	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
1) Falls of ground	277	19		3.850	0.264	-	-	-
2) Haulage and transport	213	13		2.960	0.180	-	-	-
3) Movement of personnel	65	-		0.903	-	-	-	-
4) Machinery, handling of tools and supports	163	2		2.265	0.028	-	-	-
5) Falling objects	33	-		0.459	-	-	-	-
6) Explosives and fumes	4	-		0.056	-	-	-	-
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	-	1		-	0.014	-	-	-
12) Other causes	20	3		0.278	0.042	-	-	-
TOTAL	775	38	71 952 728	10.771	0.528	-	-	-

(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: 1967
Country: France
Coal-field: Nord/Pas-de-Calais

CAUSE	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
1) Falls of ground	408	22		3.631	0.195	-	-	-
2) Haulage and transport	189	10		1.682	0.089	-	-	-
3) Movement of personnel	173	1		1.540	0.009	-	-	-
4) Machinery, handling of tools and supports	236	2		2.100	0.018	-	-	-
5) Falling objects	203	1		1.807	0.009	-	-	-
6) Explosives and fumes	1	-		0.009	-	-	-	-
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	1	-		0.009	-	-	-	-
12) Other causes	19	-		0.169	-	-	-	-
TOTAL	1 230	36	112 362 032	10.947	0.320	-	-	-

(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: 1967
Country: France
Coal-field: Lorraine

CAUSE	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
1) Falls of ground	147	4		4.055	0.110	-	-	-
2) Haulage and transport	73	2		2.013	0.055	-	-	-
3) Movement of personnel	144	2		3,972	0.055	-	-	-
4) Machinery, handling of tools and supports	47	1		1.296	0.028	-	-	-
5) Falling objects	97	-		2.675	-	-	-	-
6) Explosives and fumes	1	-		0.028	-	-	-	-
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	-	1		-	0.028	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	4	-		0.110	-	-	-	-
TOTAL	513	10	36 258 464	14.149	0.276	-	-	-

(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: 1967
Country: France
Coal-field: Centre-Midi (excl. Provence)

CAUSE	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
1) Falls of ground	112	3		3.205	0.086	-	-	-
2) Haulage and transport	90	4		2.576	0.114	-	-	-
3) Movement of personnel	82	-		2.347	-	-	-	-
4) Machinery, handling of tools and supports	226	-		6.467	-	-	-	-
5) Falling objects	88	1		2.519	0.029	-	-	-
6) Explosives and fumes	-	1		-	0.029	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	1	5		0.029	0.142	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	-		-	-	-	-	-
11) Electricity	-	-		-	-	-	-	-
12) Other causes	11	1		0.315	0.029	-	-	-
TOTAL	610	15	34 939 440	17.458	0.429	-	-	-

(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: 1967
Country: France
Coal-field: Whole country (excl. Provence)

CAUSE	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
1) Falls of ground	667	29		3.634	0.159	-	-	-
2) Haulage and transport	352	16		1.918	0.088	-	-	-
3) Movement of personnel	399	3		2.174	0.016	-	-	-
4) Machinery, handling of tools and supports	509	3		2.773	0.016	-	-	-
5) Falling objects	388	2		2.114	0.011	-	-	-
6) Explosives and fumes	2	1		0.011	0.005	-	-	-
7) Explosions of firedamp or coal dust	-	-		-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	1	5		0.005	0.027	-	-	-
9) Underground combustion and fires	-	-		-	-	-	-	-
10) Inrushes of water	-	1		-	0.005	-	-	-
11) Electricity	1	-		0.005	-	-	-	-
12) Other causes	34	1		0.185	0.005	-	-	-
TOTAL	2 353	61	183 559 936	12.819	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: 1967
Country: Italy
Coal-field: Sulcis

CAUSE	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
1) Falls of ground	7	-		5.580	-	-	-	-
2) Haulage and transport	1	1		0.797	0.797	-	-	-
3) Movement of personnel	2	-		1.594	-	-	-	-
4) Machinery, handling of tools and supports	17	1		13.552	0.797	-	-	-
5) Falling objects	8	-		6.377	-	-	-	-
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	-		3.189	-	-	-	-
TOTAL	39	2	1 254 416	31.089	1.594	-	-	-

(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: 1967
Country: Netherlands
Coal-field: Limburg

CAUSE	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
1) Falls of ground	74	3		2.466	0.100	-	-	-
2) Haulage and transport	56	-		1.866	-	-	-	-
3) Movement of personnel	23	-		0.766	-	-	-	-
4) Machinery, handling of tools and supports	25	2		0.833	0.067	-	-	-
5) Falling objects	26	-		0.866	-	-	-	-
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	21	-		0.700	-	-	-	-
TOTAL	225	5	30 012 168	7.497	0.167	-	-	-

(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 number of persons
incapacitated by underground accidents for eight weeks or longer
in 1967
per million man-hours

C A U S E	Germany (Land North Rhine/Westph. + Saar)	Belgium	France (excl. Provence)	Italy	Netherlands	Community
	1967	1967	1967	1967	1967	1967
1) Falls of ground	4.524	3.850	3.634	5.580	2.466	4.060
2) Haulage and transport	1.913	2.960	1.918	0.797	1.866	2.037
3) Movement of personnel	2.974	0.903	2.174	1.594	0.766	2.354
4) Machinery, handling of tools and supports	1.124	2.265	2.773	13.552	0.833	1.790
5) Falling objects	3.642	0.459	2.114	6.377	0.866	2.638
6) Explosives and fumes	0.017	0.056	0.011	-	-	0.019
7) Explosions of firedamp, or coal dust	-	-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0.003	-	0.005	-	-	0.003
9) Underground combustion and fires	-	-	-	-	-	-
10) Inrushes of water	-	-	-	-	-	-
11) Electricity	0.006	-	0.005	-	-	0.005
12) Other causes	0.396	0.278	0.185	3.189	0.700	0.337
TOTAL	14.599	10.771	12.819	31.089	7.497	13.246

Comparative table of accidents
resulting in death within eight weeks
in 1967
per million man-hours

C A U S E	Germany (Land North Rhine/Westph. + Saar)	Belgium	France (excl. Provence)	Italy	Netherlands	Community
	1967	1967	1967	1967	1967	1967
1) Falls of ground	0.206	0.264	0.159	-	0.100	0.192
2) Haulage and transport	0.150	0.180	0.088	0.797	-	0.128
3) Movement of personnel	0.076	-	0.016	-	-	0.044
4) Machinery, handling of tools and supports	0.020	0.028	0.016	0.797	0.067	0.024
5) Falling objects	0.063	-	0.011	-	-	0.036
6) Explosives and fumes	-	-	0.005	-	-	0.002
7) Explosions of firedamp, or coal dust	-	-	-	-	-	-
8) Sudden outbursts of firedamp, suffocation by natural gases	0.007	-	0.027	-	-	0.012
9) Underground combustion and fires	-	-	-	-	-	-
10) Inrushes of water	-	-	0.005	-	-	0.002
11) Electricity	0.003	0.014	-	-	-	0.004
12) Other causes	0.017	0.042	0.005	-	-	0.015
TOTAL	0.542	0.528	0.332	1.594	0.167	0.457

ANNEX II

IMPLEMENTATION OF RECOMMENDATIONS OF THE MINES SAFETY AND HEALTH COMMISSION (AS AT 1.1.1968)

The recommendations, assessments, principles and reports prepared by the Mines Safety Commission since the beginning of its activities and distributed to the Governments and other interested bodies in accordance with its terms of reference, for further action or for information, can usefully be classified in three groups according to their date of issue :

A - the recommendations which are included in the First and Second Reports of the Mines Safety Commission, the implementation of which was published for the last time on the basis of the situation as at 1.1.1966 given in the Third Report,

B - the recommendations which are included in the Third Report of the Mines Safety Commission, the implementation of which was published for the first time on the basis of the situation as at 1.1.1966 in the same Report,

C - the recommendations which are included in the Fourth Report of the Mines Safety and Health Commission, the implementation of which was published for the first time on the basis of the situation as at 1.1.1968 in this Report.

The following symbols are used in the tables :

C : The national regulations are already in accordance with the recommendations

C : The recommendations have not been embodied in regulations, but have been implemented de facto

NRC : New regulations in accordance with the recommendations have been drawn up and issued

NRP : The preparation of new regulations in accordance with the recommendations is in hand

E : The preparation of new regulations is being studied

? : There is uncertainty regarding the steps to be taken

A : The national authorities have abstained from bringing their regulations into line with the recommendations.

To ensure a certain degree of uniformity with regular reports on the measures taken, the following survey shows not only those recommendations which aim at modifying regulations and to this end are indicated by the letters used for the purpose, but also those which need not be implemented by means of regulations or laws. These latter call for other modes of application.

The situation with regard to implementation of the above-mentioned recommendations and proposals is indicated, with explanatory notes, in the following tables.

A - Regular report on the implementation of the Mines Safety and Health Commission's Recommendations published in the 1st and 2nd Reports

I.- TECHNICAL ASPECTS

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
A.- ELECTRIFICATION												
I - Recommendations regarding elimination of oil from underground electrical equipment (1st Report of Mines Safety Commission, p. 7 (German text))												
2a) Resistances installed underground should not contain any combustible oil. (Exceptions are allowed for the starting-up resistances of large motors driving water pumps).	C	C	NRP	NRP	NRP	NRP	E	C' + E	C'	C'	C	C
b) Condensers and transformers installed underground must not contain either combustible oil or dielectric substances which can give off noxious gases.	C	C	NRP	NRP	NRP	NRP	E	E	C'	C'	NRP	NRP
- Otherwise effective measures should be taken against the dangers to workers caused by the use of these devices.	C	C	C	C	NRP	NRP	C'	C'	C'	C'	NRP	NRP
c) Switches and relays, used underground and operating on voltages below 1,100 V, must not contain any flammable oils.	C	C	NRP	NRP	NRP	NRP	C'+ NRP	C'+ NRP	C'	C'	NRP	NRP
d) Protection of workers against dangers involved in the use of switches and relays, which work on voltages above 1,100 V and contain flammable oil.	C	C	C	C	NRP	NRP	C	C	2) -	C	C	C
3. Recommendation to continue research into the manufacture of low-oil or oil-less HT switchgear and protective relays which can give riskfree service in gassy pits.	1) A	1) A	2) -	2) -	3) C'	3) C'	C'+ NRP	C'+ NRP	2) -	2) -	NRP	NRP
Recommendation to begin detailed investigation into the degree of increased safety which can be achieved, when prescribing an explosion-proof housing for normally spark-producing components only, and a design of the "increased safety" type for all other equipment.	1) A	1) A	2) -	2) -	3) C'	3) C'	4) E	4) E	C	C	NRP	NRP
4. Extending the use of low-oil or oil-less HT switchgear and oil-less HT protective relays at points where there is no gas risk.	1) A	1) A	C	C	5) NRP	5) NRP	C'+ NRP	C'+ NRP	C	C	E	E

1) cannot be laid down in inspectorate regulations.
2) not applicable.
3) devices with satisfactory characteristics exist; the conditions of application must be specified.
4) approval regulations have been issued for equipment in the "increased safety" category, but the type of protection is left to the individual firms.
5) with regard to the approval of certain high-voltage switches.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
II - Recommendations for shotfiring leads (2nd Report of Mines Safety Commission, p. 10)												
2. Recommendations for all shotfiring leads												
- Every conductor must be provided with at least one good-quality insulation.	C	C	C	C	NRC	NRC	C	C	NRP	C'	C	C
- All connections must be properly insulated.	C	C	C	C	NRC	NRC	C	C	NRP	C'	C	C
- Every shotfiring lead must have the appropriate degree of flexibility.	C	C	C	C	NRC	NRC	C'	C'	NRP	C'	C	C
- The conductors must be of such cross-sectional area that they do not occasion an excessive voltage drop.	C	C	C	C	NRC	NRC	C'	C'	NRP	C'	C'+ NRP	C'+ NRP
- The shotfiring leads must be made up and laid so that the risk of any fault current, resulting from contact with metal objects, is reduced.	C	C	C	C	NRC	NRC	C	C	C	C	NRP + C	C'+ NRP
- Before any shortfiring operation in particular workings and before the simultaneous firing of a fairly large number of shots, the ohmic resistance of the circuit must be measured.	C	C	C	C	NRC	NRC	C	C	C	C	C	C
a) Temporary shotfiring leads												
- Careful inspection before each firing.	C	C	C	C	NRC	NRC	C	C	C'	C'	C'	C'
- Regular and thorough testing by an expert either at the surface or in an underground workshop.	C	C	C	C	NRC	NRC	C	C	E	C'	C'	C'
A thorough checking must consist of at least :												
- a careful inspection of the lead over its whole length;	C	C	C	C	NRC	NRC	C	C	C	C	C'+E	C'+E
- measurement of the insulation between the two conductors, if the lead consists of a cable or rubber-covered lead;	C	C	C	C	NRC	NRC	C	C	C	C	C'	C'
- measurement of the ohmic resistance of the lead.	C	C	C	C	NRC	NRC	C	C	E	C	C	C
b) Permanent shotfiring leads												
- Regular and thorough checks by an expert.	C	C	C	C	NRC	NRC	C	C	C'	C'	1) -	1) -
- Written record of every thorough check, with the date.	2) A	2) A	C	C	NRC	NRC	C'	C	E	C'	1) -	1) -

1) not applicable.
2) seems unnecessary and would increase administrative work.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
3. Further recommendations for permanent and temporary shotfiring leads used in gassy mines												
- The shotfiring leads must fulfil conditions which ensure sufficient safety with regard to :												
a) mechanical strength and in particular tensile, bending and abrasion strength;	C	C	C	C	NRC	NRC	C'	C'	NRP	NRP	C+C'	C+C'
b) electrical insulation;	C	C	C	C	NRC	NRC	C'	C'	NRP	NRP	C+C'	C+C'
c) impermeability (to moisture) of the insulation and the sheathing.	C	C	C	C	NRC	NRC	C'	C'	NRP	NRP	C'+ NRP	C'+ NRP
Recommendation that checking standards which correspond to the conditions be laid down.	C	C	C	C	NRC	NRC	1) -	1) -	NRP	NRP	E	E
4. Supplementary recommendations for permanent shotfiring leads used in gassy pits												
- Permanent leads should be so arranged that, as far as possible, damage during firing of the shots or from other causes is avoided.	C	C	C	C	NRC	NRC	C'	C'	C'	C'	1) -	1) -
- If the shotfiring lead consists of two separate conductors, these should be arranged sufficiently far apart and in such a way that inspection is possible.	C	C	CE	CE	NRC	NRC	C'	C'	C'	C'	1) -	1) -
- In shafts and dipping roads, the leads must have an adequate mechanical strength.	C	C	C	C	NRC	NRC	C	C	C	C	C'	C'
III - Recommendations regarding the protection of underground distribution networks against the danger of causing electric shocks (2nd Report of the Mines Safety Commission, p.13)												
I. The following recommendations refer only to the MT networks defined below; Medium Tension (MT) : the normal voltage range for working equipment used underground with three-phase A.C. (between 380 and 1,100 V). These networks should fulfil all the recommendations set out below.												
These recommendations refer neither to the HT networks, nor to voltages which are lower than the medium-tension range and are used for particular purposes (lighting, drilling apparatus, telephone installations, etc.) for which some easing of the restrictions may be allowed. Overhead wire networks with bare trolley wires are also excluded.												

1) not applicable.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
II. Protection against the risk of electric shocks												
A - First order precautions (Protection against direct contact with a live phase)												
1. Every chance contact with a live phase should be avoided as far as possible by laying the conductor out of the workmen's reach, by interposing effective barriers, by sheathing the phase or by insulating it.	C	C	C	C	C	C	C	C	C	C	C	C
2. The cables and leads used in medium-tension underground networks should be mechanically protected either by means of a metal armouring connected to the pilot lead, or by a flexible envelope of the best possible design.	C	C	C	C	C	C	C	C	C	C	C + NRP	C + NRP
- Leads without metal armouring must be electrically protected by separate or common protective screens, which trip safety devices in the event of a fault.	1) C	2) C	C	C	C	C	C	C	C	C	NRP	NRP
3. Only trained men should be allowed to open the housings of accessible live parts (medium-tension voltage range) and this only under conditions which have been clearly laid down in advance.	C	C	C	C	C	C	C	C	C	C	C	C
4. The repair and maintenance of the electrical equipment should be entrusted only to trained personnel.	C	C	C	C	C	C	C	C	C	C	C	C
B - Second order precautions (Equipotential connection between conductive parts of the installation)												
1. All underground networks must be provided with an equipotential connection between the conductive (not live in normal operation) components of the installation and the other metal elements connected thereto, such that its conductance is sufficient to prevent the occurrence, between any two points accessible to a workman simultaneously, of a voltage higher than the weak voltage.	C	C	C	C	C	C	C	C	C	C	NRP	NRP

1) in the case of new cables.
2) for old cables, a transitional delay until 1.4.1972 has been provided for.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
2. This equipotential connection (protective lead) must ensure electric connection between the conductive elements of the installation over the whole length of the network. It must be maintained in satisfactory condition and must be inspected as often as is necessary to ensure this.	C	C	C	C	C	C	C	C	C	C	NRP	NRP
3. The above-mentioned equipotential connection (protective lead) must be earthed to at least one point of the network via an earth connection of the lowest possible resistance.	C	C	C	C	C	C	C	C	C	C	NRP	NRP
4. This earth connection must be combined with the star-point earth connection, if a star-point is employed.	C	C	C	C	C	C	NRP	NRP	C'	C'	NRP	NRP
C - Third order precautions (Reduction of fault duration)												
1. Any fault current must be considered dangerous in underground medium-tension networks if, when the fault current flows through the protective lead and connected conductive components of the installation of earth, there is produced between any two points accessible to a workman simultaneously a voltage exceeding the level of a weak voltage, regardless of whether it occurs between parts of the installation or between such parts and earth.	C	C	C	C	C	C	NRP + C'	NRP + C'	E	C'	C	C
2. If the star-point of a network is earthed via a weak impedance or without any impedance, so that the presumed fault current is not restricted to a low value, then the network must be provided with safety devices which can at any time automatically isolate the damaged section of the network from the current source (or render it completely dead) before the fault current flowing through the protective lead and connected conductive components of the installation or earth reach a dangerous value.	1) -	1) -	1) -	1) -	1) -	1) -	NRP	NRP + C'	E	E	NRP	NRP

1) not applicable, as only isolated circuits are used.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Netherlands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
- Since the complete or partial cutting-off of a line voltage can have serious effects on the current supply to important equipment, appropriate preventive measures should be taken. - Only when the line has been repaired or the fault eliminated, or at the direction of a specialist who has taken all necessary precautions, may that section of the network be brought under voltage again.	C	C	C	C	NRP	NRP	NRP	NRP + C'	E	E	C	C
3. If the star-point of a network is insulated or earthed via some impedance, which restricts fault currents to a low value, the network must be fitted with supervising devices which are always in a state of readiness and which are capable: a) - either of checking the insulation of the various parts of the network and of indicating any damage they may have suffered or	C	C	C	C	NRP	NRP	NRP	NRP + C'	E	E	NRP	NRP
- of automatically cutting off the damaged section of the network from its source of current (or rendering the entire network dead).	1) -	1) -	C	C	NRP	NRP	NRP	NRP + C'	E	E	NRP	NRP
- If no automatic cut-off device is installed, the responsibility for cutting-off should be entrusted to an expert who can intervene as soon as the warning signal of the supervisory system is tripped or if the fault assumes major dimensions.	C	C	C	C	NRP	NRP	NRP	NRP	E	C'	1) -	1) -
- If cutting-off has been necessitated by one of the two cases cited above, the restoration of current may be accepted only after repair of the line or elimination of the fault, or only at the direction of an expert official, who has taken all necessary precautions.	C	C	C	C	NRP	NRP	NRP	NRP	E	C'	C	C

1) not applicable, as only isolated circuits are used.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Netherlands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
- If no automatic cut-off device is installed, the rubber-covered leads of mobile machines should be fitted with an automatic device which renders them dead as soon as there occurs a fault current which is caused by damage to the external armour or by damage to the insulation of an individual phase;	C	C	C	C	NRP	NRP	C	C	E	C'	NRP	NRP
b) - or of automatically cutting off the damaged section of the network from its source of current (or rendering the entire network dead) as soon as a double fault occurs leading to a dangerous fault current in the protective lead and connected parts of the installation.												
- In this instance, the current may be switched on again only after the line has been repaired or the fault eliminated.	1) -	1) -	1) -	1) -	NRP	NRP	NRP	NRP	E	C'	NRP	NRP
N.B. The comments on this Recommendation are given in the Second Report of the Mines Safety Commission, pp. 15/22.												
B.- MECHANISATION AND LOCOMOTIVES												
I - Recommendations regarding locomotive equipment (First Report of the Safety Commission, p. 20 (German text))												
1. New locomotives must be equipped with fixed, rigid cabins which at all times give the driver a clear view along the roadway, ahead and behind, without any need for him to put his head out of the cabin. (Fixed cabins are understood to cover those forming a part of the structure or which can be removed only laboriously with special tools.)	C 2) A 3)	C 2) A 3)	C 2) A 3)	C 2) A 3)	NRP	NRP	C 4) E 5)	C 4) E 5)	C	C	C	C
2. The locomotives in service must be modified to meet this requirement.	C	C	C	C	NRP	NRP	E	E	C	C	A	A
- locomotives which cannot be modified should gradually be withdrawn from service, within a period to be fixed by the responsible inspectorate, or	C	C	C	C	NRP	NRP	E	E	C	C	A	A

1) not applicable.
2) in the case of main-road locomotives, with the exception of "a clear view behind", which is difficult technically.
3) no application made to gateroad locomotives, because the risk of accident is increased.
4) for trolley locomotives.
5) for other than trolley locomotives.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
- only be used in roadways which are wide and high enough to eliminate accident risk.	C	C	C	C	NRP	NRP	E	E	A	A	E	E
3. For particular types of locomotive, or in certain circumstances, the responsible Inspectorate can grant exceptions from the above regulations, provided that safety regulations of equal stringency are laid down.	C	C	C	C	NRP	NRP	E	E	C 1)	A	E	E
II - Recommendations regarding the neutralisation of Diesel-engine exhaust fumes (First Report of the Safety Commission, p. 23 (German text))												
- General use of better starters.	C	C	E	E	E	E	?	?	?	?	E	E
- Intensified research into improving combustion by the use of catalysts.	A 2)	A 2)	EOP	EOP	E	E	?	?	?	- 2)	A 2)	A 2)
- Draw attention to the existence of this process.	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)	- 3)
- Continuation of the research into an automatic transmission system, which would make it possible to give Diesel engines a constant rpm.												
- Subsequent resumption of trials with the Houdry carbon monoxide purification process.	A 2)	A 2)	EOP	EOP	E	E	?	?	?	- 2)	A 2)	A 2)
C.- FIRES AND UNDERGROUND COMBUSTION												
I - Recommendations regarding equipment for shafts in connection with the prevention of fires (First Report of the Safety Commission, p. 11 (German text))												
2. Steps to prevent any accumulation of grease and coaldust (First Report of the Mines Safety Commission, p. 15 (German text) and Report of the Conference, p. 54, No. 2, para. C.)												
- Skip-winding installations should as far as possible be sited only in upcast shafts;	C'	C'	A	A 4)	E	E	A	A	C'	C'	C	C
- Equipment in new shafts should be of aerodynamic form;	C'	C'	CE	C'	E	E	E	E	E	E	C	C
- all suitable steps should be taken to avoid in every case any accumulation of dust to ensure that any such accumulation is removed.	C	C	C	C	NRC	NRC	C	C	C	C	C	C
3. Preferred siting of methane-drainage lines in upcast shafts (First Report of the Mines Safety Commission, p.16 (German text) and Report of the Conference, p. 54, No. 3, Par. d)												
- This recommendation of the Conference applies particularly to pressure lines.	C	C	C	C	NRC	NRC	E	E	A	- 5)	C	C

1) article 689 of Mining Regulations provides for a temporary exemption only.
2) not suitable for being laid down in inspectorate regulations.
3) not applicable.
4) all skip-winding equipment still in use is installed in downcast shafts.
5) no methane-drainage lines in service.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
4. Siting electric cables, compressed-air mains and gas-drainage pipes (First Report of the Mines Safety Commission, p. 16 (German text) and Report of the Conference, p. 54, No. 3, par. e)												
- electric cables and leads, compressed-air drains and gas-drainage pipes should not be sited in the haulage compartment:	C	C	C	C	NRC	NRC	E	E	C'1)	C'	C	C
- electric cables should not all be sited in the same shaft.	C	C	C	C	NRC	NRC	E	E	C'	C'	C	C
II- Guiding principles for fighting mine fires by sending down water (Second Report of the Mines Safety Commission, p. 26)												
1. Installation												
a) At the top of every shaft reaching to the surface there must be a device which can send down at least 50 litres of water per minute and per square metre of shaft cross-section.	C	C	C	C	NRC	NRC	E	E	E	E	C	C
b) This device must be installed in such a way that the supply of water can at no time be seriously affected by drawing-off or flowing-away of water at other points.	C	C	C	C	NRC	NRC	E	E	E	E	C	C
c) The water pipes and the spray jets must be set in such a way that they are protected from frost.	C	C	C	C	NRC	NRC	E	E	E	E	C	C
d) The damming device or devices must be set outside the shaft-top building in such a way that they can be operated at any time. They must be marked by means of an instruction plate.	C	C	C	C	NRC	NRC	E	E	E	E	C	C
2. Fires in down-cast shafts												
a) Immediate measures												
- it is essential to indicate in the fire-fighting plan the maximum amount of water which can be sent down each of the down-cast shafts, without creating additional dangers for the workers by its effects on the ventilation.	A 2)	A 2)	A 3)	A 3)	E	E	E	E	E	E	E	E
- the damming device which can be operated at this stage must not release more than this prescribed quantity of water.	A 4)	A 4)	A 3)	A 3)	E	E	E	E	E	E	E	E

1) in the case of electric cables and leads, and compressed-air lines; no methane-drainage pipes in service.
2) there are doubts as to the practicability of the Recommendation; minimum water quantities are laid down.
3) not suitable for inclusion in regulations.
4) there are doubts as to the practicability of the Recommendation.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
- until the leader of the rescue operations has issued his instructions and as long as there has been no reversal of ventilation, water may be sent down only by opening the damming device prescribed for this purpose.	A 1)	A 1)	A 2)	A 2)	E	E	E	E	E	E	E	E
b) Measures to be taken on the instructions of the leader of rescue operations												
- the leader of the rescue operations must therefore decide - taking into account all the circumstances - either to send down an increased quantity of water - or he must give orders that reversal of the ventilation be brought about or encouraged.	A 2)	A 2)	A 2)	A 2)	E	E	E	E	E	E	E	E
- to facilitate the reversal of the ventilation in the burning downcast shaft, once this has been opened and the main fan stopped, water can be sent down the upcast shaft.	C	C	C'	C'	E	E	E	E	E	E	C	C
- if reversal of the ventilation has already occurred - either as a result of the upward current produced by the heat of the fire or deliberately - downcast shafts should be treated as though they were upcast shafts.	C	C	C'	C'	E	E	E	E	E	E	C	C
- if the calculated water quantity appears to be too small to extinguish the fire immediately, or to hinder its spread, additional precautions must be worked out and laid down in the fire-fighting plan:												
- simultaneous supply of water down all downcast shafts,	A 2)	A 2)	A 2)	A 2)	E	E	E	E	E	E	E	E
- partial shutting-off of the burning shaft at surface level,	A 3)	A 3)	A 3)	A 3)	NRC	NRC	E	E	E	E	E	E
- shut underground fire-doors, etc.	A 3)	A 3)	C	C	E	E	E	E	E	E	E	E
3. Fires in upcast shafts												
- in upcast shafts, water may be sent down only on the instructions of the leader of the rescue operation.	C	C	C	C	E	E	E	E	E	E	C	C
- as long as there are still any workers in the pit, only so much water may be sent down as will allow the fumes of the fire to continue to be extracted whilst the water is falling.	C	C	C	C	E	E	E	E	E	E	C	C

1) there are doubts as to the practicability of the Recommendation.
2) not suitable for inclusion in regulations.
3) not suitable for inclusion in regulations; must be decided separately in each case.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
Note. A commentary and examples (with diagrams), regarding the calculation of the effect of falling water on the ventilation are given in the Second Report of the Mines Safety Commission, pp. 29-50.												
III - Recommendations for the sealing-off by dams of mine fires and underground combustion (Second Report of the Mines Safety Commission, p. 53)												
Introductory remark												
The following Recommendations are not binding. They are not intended to give Inspectorates "ready-made" regulations; on the contrary, it remains for the competent authorities to decide how these Recommendations are to be applied as regulations, circulars or service instructions.												
These Recommendations refer only to the actual fighting of the fire or combustion; they do not refer to the measures to be taken as a matter of priority to rescue men following the outbreak.												
A - When a mine fire has broken out or underground combustion developed, it is indispensable to take the necessary preparatory steps for any later sealing-off by dams which may be necessary while the direct fire-fighting operations are still going on.	C	C	C	C	NRC	NRC	C'	C'	C'	C'	C	C
- In the event of sealing-off by dam becoming necessary, as a general rule the first stoppings to be erected must be advance dams.	C	C	C	C	NRC	NRC	C'	C'	C'	C'	C	C
These advance dams are in fact the real subject of the present Recommendations.												
B - Structure and erection of the advance dams												
1. If there is no risk of explosion (1):												
a) to make the advance dams themselves as air-tight as possible and to create the closest possible seal between the dam and the surrounding walls;	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
b) there is nothing against shutting off first of all the intake air.	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
2. If there is a risk of explosion:												
a) - to have at all times the most precise information possible regarding the degree of explosion risks in the fire zone;	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C

1) for the assessment of the risk, see chapter A - II a), p. 52.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1968	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
- it may be necessary to provide the men constructing the advance dams with fire-proof clothing;	C	C	C	C	E	E	C'	C'	E	E	C	C
b) - to ensure that the advance dams are as air-tight as possible;	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
- to ensure that they are strong enough to resist an explosion;	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
c) - to ensure that for the entire period during which the stopping is being erected, there is sufficient ventilation of the fire zone to counter as far as absolutely possible the formation of an explosive gas mixture;	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
d) - to ensure that all suitable measures are taken to reduce as far as possible the effects of any explosion which may occur; (dust barriers, stone-dusting or water trough barriers);	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
e) - to the greatest possible extent, the dams on the intake and return sides should be sealed simultaneously;	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
- only the number of workers and members of the staff strictly necessary for this work should stay behind;	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
- as soon as the dams have been sealed, the danger area must be completely evacuated.	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
C - The final dams must be durable, built of brick or concrete under the protection offered by the advance dams.	C	C	C	C	NRC	NRC	C'	C'	E	E	C	C
Note: Additional details to the foregoing Recommendations are given in a Commentary (Second Report of the Mines Safety Commission, pp. 53/58).												

II.- HUMAN FACTORS

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
A.- RECOMMENDATIONS REGARDING MEDICAL EXAMINATION (SECOND REPORT OF THE MINES SAFETY COMMISSION, p. 79)												
I - Pre-Entry Medical Examinations												
- All applicants for employment at collieries should undergo a pre-entry medical examination.	C	C	C	C	C	C	C	C	C	C	C	C
- This must establish that the applicant shows no symptoms rendering him unfit for such employment.	C	C	C	C	C	C	C	C	C	C	C	C
The pre-entry medical examination must include:												
- a general examination - such special examination as may be deemed necessary for the purpose.	C	C	C	C	C	C	C	C	C	C	C	C
- The examinations effected must include, as regards the chest, a radiograph or radiophotograph of format not smaller than 70 x 70 mm;	C	C	C	C	C	C	C	C	E	C	C	C
- the latter to be supplemented if need be by a standard-format (1 : 1) radiophotograph;	C	C	C	C	C	C	C	C	E	C'	C	C
- The nature of these examinations and	C	C	C	C	C	C	C	C	E	C'	C	C
- the practical details, together with	C	C	C	C	C	C	C	C	E	C'	C	C
- the criteria on which the doctor should base his findings,	C	C	C	C	C	C	C	C	E	C'	C	C
- should be defined by medical experts.	C	C	C	C	C	C	C	C	E	C'	C	C
- In the case of recruitment for work, whether below or above ground, where the worker will be exposed to a dust hazard, the examination must show a normal pulmonary image.	C	C	C	C	C	C	C'	C'	E	C'	C	C
- The concept of normal pulmonary image must be defined by medical experts.	C	C	C	C	C	C	C'	C'	E	C'	C	C
- These are to be regarded as minimum medical recommendations. - The points concerning the number and type of examinations to be carried out, - the effecting of radiological examinations - the definition of the normal pulmonary image - are subject to review in each country - whenever this is felt to be appropriate in the light of progress in medical and radiological knowledge - working conditions, and - preventive measures.												

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
II - Special Examinations												
1. The object of special medical examinations should be to establish - taking into account, according to circumstances, the opinions of - the training	C	C	C	C	NRP	NRP	C'	C'	E	E	C	C
- vocational-guidance and applied psychology	C	C	C	C	NRP	NRP	C'	C'	E	E	C'	C'
- and other services concerned a worker's fitness for certain specific occupations.	C	C	C	C	NRP	NRP	C	C	C	C	C	C
2. Such examinations are essential in the case of jobs - which, either in themselves or owing to the conditions under which they are performed, involve a special hazard to the worker himself or to others as regards health and/or safety,	C	C	C	C	NRP	NRP	C	C	C	C	C	C
- which involve special health or safety requirements, - or which demand particular physical aptitudes or characterological qualities.	C	C	C	C	NRP	NRP	C	C	C	C	C	C
3. No attempt has been made here to list in full the cases in which special examinations are necessary, this being left to the competent authorities in each country. Examples include: - winding enginemen, - staple pit enginemen, - motormen (drivers of locomotives, mobile haulers and surface vehicles), - workers assigned to hot workings, - all those employed on cage handling.												
III - Routine examinations during employment												
A - Periodic health checks												
- The object here is to establish whether the subject is still fit for duty,	-	-	CE	C	C	C	C	C	C	C	C	C
- to detect any symptoms of occupational disease at the earliest possible stage,	-	-	C	C	C	C	C	C	-	C'	C	C
- where appropriate to help supervise the subject's health generally.	-	-	C	C	C	C	C	C	-	C'	C	C
- All personnel should undergo such check-ups at intervals.	CE[1)]	C'	CE[1)]	C	C	C	C	C	C	C	C	C

1) fulfilled for underground workers; fulfilled only for certain categories of surface workers.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
- The interval is fixed at two years.	C	C	CE	NRC	C	C	C[1)]	C[1)]	C[2)]	C[2)]	C	C
- The interval is reduced for workers under 21.	C	C	CE	NRC	C	C	C[3)]	C[3)]	C	C	E	E
- The interval should be considered as a maximum figure.	C	C	-[4)]	-[4)]	-[4)]	-[4)]	C	C	C	C	C	C
This interval can also be reduced:												
- if the state of health of a worker indicates that such a reduction is desirable;	C	C	C	C	C	C	C	C	E	C'	C'	C'
- in relation to the type of work performed;	C	C	C	C	NRP	NRP	C	C	E	E	C	C
- because of the nature of the place at which the work is being done.	C	C	C	C	NRP	NRP	C	C	E	E	C	C
B - Medical examinations on specific occasions												
1. In the case of reassignment												
- Workers whom it is proposed to assign to jobs involving hazards not previously taken into account for the man concerned should be re-examined.	C	C	CE	C	NRP	NRP	C	C	E	E	E	E
2. Medical examination following absence from work												
- Where a man's return to work after an illness or accident involves risk to the safety of himself or others, he may be subjected to a special examination,	C	C	C'	C'	NRP	NRP	NRP +C'	NRP +C'	E	E	C'	C'
- the type and extent of which should be fixed in each case according to the circumstances.	C	C	C'	C'	NRP	NRP	C'	C'	E	E	C'	C'

1) the interval is one year.
2) article 648 of Inspectorate Regulations provides for an interval of one year.
3) for workers under 18 years of age.
4) not applicable.

B - Regular Report on the implementation of the Mines Safety and Health Commission's Recommendations published in the Third Report

I.- TECHNICAL ASPECTS

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
I - Recommendations regarding the protection of underground electrical networks against fire and firedamp-explosion risks (Doc. 1156/61/4)												
1. Recommendations regarding the protection of underground electrical networks against fire risk												
A - First-order precautions - avoidance of fire risk												
1) Avoidance of excessive heating of cables in normal use by providing adequate conductivity. Avoidance of unforeseen local heatings by the use of suitable designs and by proper supervision.	C	C	C	C	C	C	C	C	C'	C	C + NRP	C + NRP
2) Reduce the possibility of faults and short-circuits occurring between conductors, or between conductor and earth, by adequate insulation or proper spacing of the conductors.	C	C	C	C	C	C	C	C	C'	C'	C + NRP	C + NRP
B - Second-order precautions - protection against the effects of a heating or a fault												
1) Use of heat-stable insulations.	C	C	C	C	C	C	NRP	NRP	C'	C'	C + NRP	C + NRP
2) Use of protective sheathing for equipment and for cables, made of flame-resistant and non-propagating material.	C	C	NRC + E	C	NRP	NRP	C[1]	C[1]	C'	C'	C + NRP	C + NRP
- Use of oil as a non-conductor only if no fire risk for the workers is involved.	C	C	C	C	NRP	NRP	C	C	C'	C'	C + NRP	C + NRP
3) Accumulations of flammable or combustible materials and pipelines for combustible gases should be sited well away from electrical equipment.	C + NRC	C	C+C'	C+C'	C	C	C'+ NRP	C'+ NRP	C'	C'	C + NRP	C + NRP
C - Third-order precautions - measures regarding the network												
1) Automatic protection of networks against abnormal overloads.	C	C	C	C	C	C	C	C	C'	C'	C + NRP	C + NRP

1) with respect to armoured cables.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
2) Automatic protection of networks against short-circuit; these protective devices must be capable of handling the maximum short-circuit current at their point of installation.	C	C	C	C	C	C	NRP	NRP	C'	C	C + NRP	C + NRP
Selecting and regulating of these devices in relation to the minimum short-circuit current which can occur at the end of the section they protect.	C	C	C	C	C	C	NRP	NRP	C'	C'	C + NRP	C + NRP
3) Steps to give effective protection against low-current faults, which might get past the above-named protective devices and cause dangerous heatings.	NRP	NRP	? 1)	NRP	NRP	NRP	C	C	C'	C'	C'+ NRP	C'+ NRP
2. Recommendations for the protection of underground electrical networks against firedamp-explosion risks												
A. First-order precautions - prevention of accumulations of firedamp												
1) The firedamp content at the site of the electrical apparatus must be kept within the limits prescribed by the Inspectorate.	C	C	C	C	C	C	C	C	C'	C	C	C
2) The ventilation situation must be checked before any new installation or extension of electrical equipment.	C	C	C	C	C	C	C	C	C'	C'	C'+ NRP	C + NRP
3) There must be a thorough investigation of the possible consequences of any alterations in working method, of ventilation or gas omission, which might cause problems in the vicinity of electrical equipment.	C	C	C	C	NRP	NRP	C	C	C'	C'	C'	C'
B. Second-order precautions - protection against ignition												
1) In gassy workings: use of electrical equipment which is permitted by the Inspectorate only under its own specified conditions.	C	C	C	C	C	C	C	C	C	C	C + NRP	C + NRP
2) The electrical equipment must be installed, used, supervised and maintained in such a way as to keep it flameproof.	C	C	C	C	C	C	C	C	C'	C	C + NRP	C + NRP
All cables must be of adequate mechanical strength.	C	C	C	C	C	C	C	C	C	C	C + NRP	C + NRP
All cables must be installed and maintained without damage.	C	C	C	C	C	C	C	C	C'	C	C	C

1) no suitable devices for the determination of these faults available.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	l.l. 1966	l.l. 1968	l.l. 1966	l.l. 1968	l.l. 1966	l.l. 1968	l.l. 1966	l.l. 1968	l.l. 1966	l.l. 1968	l.l. 1966	l.l. 1968
C. Third-order precautions - cutting off the circuit												
1) Networks must be designed and installed in such a way that any fault current which may arise between phase and earth is reduced to a low value or quickly cut off.	NRP	NRP	C	C	NRP	NRP	C	C	C'	C	C + NRP	C + NRP
2) A protective relay, preferable automatic, must be provided against between-phase faults and earth faults.	NRP	NRP	C 1) + NRP	C 1) + NRP	NRP	NRP	C	C	C'	C	C' + NRP	C' + NRP
3) Precautions must be taken to avoid accidents when faults are being sought or dealt with.	C	C	C 1) + NRP	C	NRP	NRP	C	C	C'	C	C C'+ NRP	CC' + NRP
4) Protection must be given to leads without metallic sheathing, and to those which supply movable machines, by means of individual or collective screens which bring a protective device into operation if a fault occurs.	C	C	NRC	C	C + NRP	C + NRP	C	C	C'	C'	C'+ NRP	C'+ NRP
5) If the firedamp content rises above the prescribed limit, all the sections of the network involved must be cut off.	C	C	C	C	C	C	C	C	C'	C	C	C
Issuing instructions to maintain in operation certain machines which provide ventilation.	C	C	C	C	C	C	C	C	C'	C	C +C'	C+C'
Restarting only when the firedamp content has fallen below the permissible value, and only on the orders of a trained person.	C	C	C	C	NRP	NRP	C	C	C'	C	C + NRP	C + NRP
Supplementary precautions for pits liable to sudden outbursts of gas												
1. Risk of damage by particles projected by an outburst of gas												
- The threatened zones in which projection can occur should not be electrified.	A	A	C	C	NRP	NRP	C 2)	C 2)	A 3)	C 3)	A	A
- The electrical equipment and cables should be protected against heavy blows.	A	A	C	C	C	C	C	C	A 3)	C 3)	C	C
- The electrical equipment should be designed to give adequate robustness.	A	A	C	C	C	C	C	C	A 3)	C 3)	C	C

1) available for movable equipment.
2) the use of electricity is forbidden in pits liable to sudden outbursts of gas, excepting for lighting and shot-firing. Exceptions can, however, be approved by the senior mining engineers: when using armoured cables, telephone installations and methanometers in intake airways - provided that no damage is likely to occur as a result of a gas outburst - and also in main return airways.
3) No pits liable to sudden outbursts of gas. However, in pits or parts of mines which are considered to be liable to sudden outbursts of gas, the use of electricity, excepting for lighting purposes and portable lamps, must be authorized by a senior mining engineer, subject to the observance of all other measures, precautions or restrictions which might be included in the authorization such as for example the above-mentioned recommendations.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
2. The risk of firedamp concentrations												
- Increased ventilation	C'	C'	C'	C'	C'	C'	C	C	A 1)	C 1)	C	C
- Use of remote-indicating methanometers or ventilation-fault detectors which can cut off the threatened section of the network	C'	C'	E 2)	E 2)	E	E	C	C	A 1)	C 1)	C'+ NRP	C + NRP
- Relaxation shot-firing only after all equipment has been switched off.	C'	C'	C'	C'	NRP	NRP	C	C	A 1)	C 1)	-	-
3. Supplementary electrical precautions												
a) Preferable use of a starpoint earthed via a strong impedance, e.g. by means of an insulation detector.	C	C	C	C	NRP	NRP	NRP	NRP	A 1)	C 1)	NRP	NRP
b) Quickest possible automatic protection of the network against all insulation faults, even if formed by resistances between phase and earth.	NRP	NRP	C + NRP	C + NRP	NRP	NRP	C	C	A 1)	C 1)	C + NRP	C + NRP
II - General guidelines for the opening-up of sealed-off fire areas (Doc. 1304/3/64)												
I. GENERAL							3)	3)				
Special reasons for opening-up a district sealed-off after a fire: - recovery of bodies - salvage of material - recovery of roadways and workings - reduction of the sealed-off area - inspection of the district, and, if necessary, - direct fire-fighting.												
The following hazards can arise from reopening a sealed-off district: - release of CO, foul air and hot damp air, - explosion of firedamp or fire gas, where the fire is not yet extinguished, - recrudescence of the fire, which need not necessarily occur immediately, but even after some time has elapsed.												
Recrudescence of the fire can occur only when fresh air reaches the seat of the fire, so that with all operations involved in reopening a fire area it is of prime importance to inspect the individual air currents constantly.	C	C	C	C	C	C	C'	C'	C'	C'	NRP	NRP

1) no pits liable to sudden outbursts of gas. (See note 3, previous page)
2) already applied in individual cases.
3) the opening-up of fire areas is carried out on the responsibility of the manager, who prepares a reopening plan - taking into account the scale and type of fire and the ventilation situation in the fire area - in collaboration with the Main Rescue Station. The action plans of the Main Rescue Stations very largely embody the guidelines laid down in Doc. 1304/3/64 .

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
All places suspected of having been seats of fire or heatings must be ascertained with the utmost speed.	E	NRP	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
II. BASIC RULES												
Sealed-off districts may be reopened only after the competent authorities have been notified or have given their permission.	C	C	C	C	C	C	C 1)	C 1)	C'	C 1)	C'	C'
Before opening commences, gas samples must be taken from the fire area, at each stopping and from all sampling pipes.	C	C	C	C	C	C	C'	C'	C'	C	C'	C'
The gas samples are analysed and the results assessed from the point of view of explosion risk in the sealed-off area and the state of the seat of the fire.	C	C	C	C	C	C	C'	C'	C'	C	C'	C'
The cooling-off time of the seat of the fire must be taken into account.	E	NRP	C	C	C'	C'	C'	C'	C'	C'	C'	C'
If possible, the sealed-off district should be inspected before any air is circulated or any operations are started.	A	A	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
Before opening commences, a plan should be drawn up jointly with the Main Rescue Centre.	C	C	NRP	C	C'	C'	C'	C'	C'	C'	C'	C'
This plan must cover the following points: - the method, - nature, scope and order of operations, - direction and supervision, - checking of the ventilation system and of the composition of the air, - communications, - preparation of material, - evacuation, prohibition of access to and remanning of endangered workings, - deployment of the Rescue Team, - connection and disconnection of electrical equipment and cutting-off the supply of electricity in both equipment and part of network concerned, - opening and closing of the compressed air, water and methane-drainage pipeline valves, - re-sealing of the fire area in emergency.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
The method to be adopted for re-opening sealed-off districts depends on the presence or otherwise of - non-explosive gaseous mixtures which remain non-explosive on dilution with air, - non-explosive gaseous mixtures which may become explosive on dilution with air, or - explosive gaseous mixtures.												

1) applies only to the opening-up of fire areas after particularly large fires.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
Fire areas may be opened at one point or at several points. In the latter case, a continuous direct circulation of air is automatically established and the fire area is permeated with fresh air. An examination should be made of the effects of the opening of the area on the ventilation system of the pit as a whole and within the fire area.	C	C	C'+C	C'+C	C'	C'	C'	C'	C'	C'	C'	C'
A sealed-off district may be re-opened by - breaching one or more stoppings (with or without the use of an air-lock), or - cutting a new entry into the fire-area. Before opening a sealed-off area, provision should be made for immediate reclosure if necessary.	C	C	C	C	C	C	C'	C'	C'	C'	C'	C'
Stoppings may be opened only on the instructions of the manager underground and under the constant supervision of personnel appointed by him.	C	C	C	C	C'	C'	C	C	C'	C	C'	C'
Workings, into which the opening of a stopping may release toxic gases or foul air, or where there is a risk of explosion, must be evacuated and put out of bounds to personnel before opening.	C	C	C	C	C'	C'	C	C	C'	C'	C	C
Since conditions in the district, the state of the seat of the fire and the risk of gas explosion may change during the opening operation the composition of the fire gases or fumes must be checked at regular intervals.	C	C	C	C	C	C	C	C	C'	C'	C'	C'
The kind and number of samples and the points at which they are to be taken should be fixed in advance.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
In doing so, the possibility of gas accumulations forming should be allowed for. (In general, the formation of gas layers is fostered by low air velocities and differences in temperature.)	C	C	NRC	C	C'	C'	C'	C'	C'	C	C	C
Where a stopping is opened in the knowledge that a fire is not yet extinguished, or where the fire is revived as a result, the area in question must be resealed at once, if the composition of the fire gases or fumes changes in such a way that an explosion hazard might arise.	C	C	C	C	C	C	C'	C'	C'	C'	C'	C'
With non-explosive gas mixtures in the fire area, this is necessary only if extinguishing operations seem unlikely to succeed.	C	C	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
It is the responsibility of the Rescue Team to open and inspect fire areas, even after they have been ventilated.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Netherlands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
On the intake side, breaching of stoppings need not be carried out by the Rescue Team provided that no gas hazard is to be reckoned with.	C	C	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
When deploying the Rescue Team, allowance should be made for the adverse climatic conditions which are likely to obtain at any point where they may be employed.	C	C	C	C	C'	C'	C	C	C'	C'	C	C
III. OPENING-UP SEALED-OFF DISTRICTS CONTAINING NON-EXPLOSIVE GAS MIXTURES												
1. Opening-up one side only												
A sealed-off district containing non-explosive gas mixtures may be opened on one side even if the fire is not yet extinguished.												
It must first be established whether the remaining stoppings and seals are sufficiently airtight and that there is no risk of releasing fire gases, in particular carbon monoxide in other parts of the working, which may be connected with the fire area.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
If the stopping to be opened is on the return side, special attention should be paid to the release of CO or of other toxic or dangerous gases or foul air.	C	C	C'	C	C	C'	C	C	C'	C'	C'	C'
The decision as to whether to carry out operations in the fire area without ventilation air or with auxiliary ventilation depends on the purpose of the reopening of the area, the expected duration of the Rescue Team's operations and the possible hazards involved. Auxiliary ventilation is especially desirable for extended operations within the fire area.												
a) Working without ventilation air, especially behind an airlock, has the advantage of eliminating the risk of reviving the fire. When carrying out extinguishing operations without ventilation air and under unfavourable air conditions, it is advisable first to set up water sprinklers or nozzles and to put these into operation only after the Rescue Team has left the fire area.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
b) If auxiliary ventilation is used, it should preferably be by suction.	C	C	A 1)	A 1)	C'	C'	C'	C'	? 2)	- 2)	C'	C'

1) experience hitherto has shown that blowing auxiliary ventilation is preferable, to ensure that no explosive gases are sucked in by the auxiliary fan
2) the use of blowing auxiliary ventilation is preferred

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	**1.1. 1966**	1.1. 1968	**1.1. 1966**	1.1. 1968	**1.1. 1966**	1.1. 1968	**1.1. 1966**	1.1. 1968	**1.1. 1966**	1.1. 1968
It is advisable to isolate the fire area ventilated by an auxiliary fan from the non-ventilated section by means of an auxiliary stopping if the seat of the fire is situated in the non-ventilated section.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
2. Opening on two sides to establish a circulation of air round the sealed-off area A sealed-off area containing non-explosive gas mixtures may be ventilated only if it is likely that the fire is extinct.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
While ventilation is being established, a Rescue Team wearing breathing apparatus may enter the fire area to examine conditions within it and to extinguish any fires.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
IV. REOPENING OF SEALED-OFF DISTRICTS CONTAINING GAS MIXTURES WHICH MAY BECOME EXPLOSIVE ON DILUTION WITH AIR 1. Opening on one side only A sealed-off area containing gas mixtures which may become explosive on dilution with air may be opened on one side only, even if the fire is not yet extinguished. It is, however, essential to install a tight airlock in front of the stopping to be opened, so as to ensure an effective air seal.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
It must first be checked whether the remaining stoppings and seals are sufficiently air-tight and that there is no risk of releasing fire gases, in particular carbon monoxide, into other parts of the workings which may be connected with the fire area.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
If the stopping to be opened is on the return side, particular attention must be paid to the possibility of releasing CO, CH_4 or foul air	C	C	C	C	C'	C'	C	C	C'	C'	C'	C'
All operations must be carried out without ventilation air.	C	C	C	C	C'	C'	C	C	C'	C'	C'	C'
There must be continuous sampling and evaluation of the results of analysis to check whether the gas mixture remains non-explosive.	C	C	C	C	C'	C'	C	C	C'	C'	C'	C'
For extinguishing operations, see section III.1.												

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
If the size of the sealed-off area is to be reduced, a new explosion-proof stopping must be erected. In order to be able to erect this stopping under tolerable climatic conditions and possibly without wearing breathing apparatus, auxiliary ventilation may have to be provided.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
For this purpose, an auxiliary stopping must first be erected and sealed in an unventilated atmosphere. (Before constructing the main stopping, it should be considered whether to erect several successive auxiliary stoppings, according to the possible hazards.)	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
The section of roadway thus recovered must then be ventilated by an auxiliary fan so as to create suitable air conditions for the erection of the main stopping.	C'	C'	C	C	C'	C'	C'	C'	C'	C'	C'	C'
When starting up the auxiliary ventilation, it must be remembered that the gas mixture becomes explosive on dilution with air. It is therefore essential to ensure that there is no source of ignition in the workings to be ventilated.	C	C	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
In addition, it is essential to make certain that the fan used cannot cause any risk of ignition.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
Before starting up the auxiliary ventilation, all workings likely to be exposed to the hazards of fire gases or explosions must first be evacuated and access thereto prohibited.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
Electrical equipment must be cut off from the power supply.	C	C	C	C	C	C'	C'	C'	C'1)	C'1)	C'	C'
In addition, the ventilation must, as far as possible, be regulated so that no explosive gas mixtures can be released over long distances.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
For this purpose, the quantity of air circulated should, if necessary, be increased.	C	C	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
2. Opening on two sides to establish a circulation of air through the fire area This method of opening automatically results in the formation of a through air-current in the open district, but not necessarily in other parts of the district. The method can be used only if there are no remaining signs of fire in the district.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'

1) special attention is drawn to the fact that the fan must be switched off.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
In addition, a period long enough for the seat of the fire to cool off must have elapsed since the estimated time of extinction.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
If possible, the Rescue Team should carry out an inspection in an unventilated atmosphere.	A	A	C	C	C'	C'	C'	C'	C'	C'	C'	C'
Failing this, the results of the snuffle pipe tests should be used to determine the condition of the seat of the fire.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
Furthermore, it should be considered in such cases whether the method described in section IV.1 might not be preferable.	E	NRP	- 1)	C'	C'	C'	C'	C'	C'	C'	C'	C'
In each case, it is essential to check the likelihood of a recrudescence of the fire during ventilation, by means of fire gas samples.	C'	C'	C	C	C'	C'	C'	C'	C'	C'	C'	C'
This applies particularly in the case of a much-branched district.	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
Before ventilating the fire area, all workings exposed to the hazards of fire gases or explosions of fire gases or fire-damp when the stopping is opened must be evacuated.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
All electrical installations in these workings must be cut off from the power supply.	C	C	C	C	C	C	C'	C'	C'	C'	C'	C'
On safety grounds, it is advisable to open the return stopping first.	E	NRP	C	C	C'	C'	C'	C'	C'	C'	C'	C'
After the Rescue Team has withdrawn to less dangerous zones, the intake stopping should be opened.	E	NRP	C	C	C'	C'	C'	C'	C'	C'	C'	C'
When ventilating the fire area, the quantity of air and the content of inflammable gases in the air-current circulating through the fire area, and in the current into which it subsequently flows, should be checked.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
The two air-currents should be mutually adjusted in such a manner as to ensure that no explosive mixture of gases is present over long distances after their junction.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
Access to the fire area is prohibited until it has been ventilated.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'

1) not applicable.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
V. OPENING OF FIRE AREAS CONTAINING EXPLOSIVE GAS MIXTURES Sealed-off districts may not be re-opened, either on one side or on two sides, if the presence of explosive gas mixtures behind the stoppings is established.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
VI. OPENING OF FLOODED FIRE AREAS The composition of the air in fire areas flooded to extinguish the fire must be checked after draining.	C	C	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
In workings with solid coal, allowance must be made for the increased hazard of spontaneous ignition after drainage. Where fire areas have been isolated by local flooding instead of by stoppings, the rules mentioned in section I to V should be observed, insofar as applicable, when opening a district.	C	C	C'	C'	C'	C'	C'	C'	C'	C'	C'	C'
VII. REMANNING OF FIRE AREAS After ventilating a fire area, workings may not be manned until a Rescue Team has established that all workings are free of noxious gases.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'
If the fire area is merely being reduced in size, workings free of noxious gases may be manned only when the remainder of the fire-area has been sealed-off by permanent stoppings.	C	C	C	C	C'	C'	C'	C'	C'	C'	C'	C'

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
III - Guidelines for the construction of advance fire stoppings from plaster (doc. 4928/63/2)												
In all cases where it is possible and advantageous, the erection of plaster stoppings to seal off fires and heatings is recommended.												
Is this process applied in practice as laid down in the guidelines contained in the report?	NRP	NRP	1) no	NRC	yes	yes	2) yes	2) yes	E	E	E	E
Is the application of this process prescribed by regulations?	NRP	NRP	no	NRC	no	no	no	no	E	no	E	E
Is this process applied in practice in a manner differing from the principles laid down?	NRP	NRP	no	yes	no	no	no	no	E	no	E	E
Is the application of this modified process prescribed by regulations?	NRP	NRP	no	yes	no	no	no	no	E	no	E	E
IV - Second report on specifications and test conditions relating to fire-resistant fluids used for power transmission (doc. 700/2/63)												
Part II - Specifications and test conditions (pp. 12 onwards)												
Article 1 - Conditions of authorisation												
1. Fire-resistant fluids for hydraulic power transmission and hydraulic control, before being used in mine workings, must be given a certificate of approval.	C	C	NRC	C	C'	C'	C'3) +E4)	C'3) E 4)	E	E	E	E
This certificate must indicate that the product has been subjected to the following tests:												
a) Laboratory tests (articles 3 - 7)												
aa) to determine criteria of flammability (article 3, p.15)	C	C	NRC	C	C'	C'	C'E	C'E	E	E	E	E

1) tests with wet-flushed fly-ash dams are to be made, instead of plaster stoppings, which will be tested subsequently.
2) the choice of means is, however, left to the mine-manager.
3) in the Charbonnages de France register, the Mines Safety Commission Recommendations have been taken into account.
4) the question of drawing up a new regulation is being examined by the competent authority.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
bb) to determine health criteria (article 4, p. 16)	C	C	NRC	C	C'	C'	C'E	C'E	E	E	E	E
cc) to determine technical criteria (article 5, p. 16)	C	C	NRC	C	C'	C'	C'E	C'E	E	E	E	E
b) Long-term tests during normal operations (article 8, p. 24)	C'	C	C'	C'	C'	C'	C'E	C'E	E	E	E	E
2. These tests are carried out under an authorised body.	1) C+C'	C	NRC	C	C'	C'	C'E	C'E	E	E	E	E
3. Authorisation for use underground should be dependent on presentation of the certificate mentioned in 1. above.	C	C	NRC	C	C'	C'	C'E	C'E	E	E	E	E
Article 9 - Withdrawal of approval At the request of the authorised body, the permitting authority may withdraw the approval for the fluid to be used in mine workings.	C	C	NRC	C	NRP	NRP	C'E	C'E	E	E	E	E
V - Report on the electro-magnetic examination of winding rope (doc. nr. 8470/64/2). Steps taken to develop electro-magnetic testing methods and results obtained.	C'2	C 2)	- 3)	- 3)	C'2)	C'2)	C'2) +4)	C'2) +4)	?	?	C'	C'
VI - Report on the use of accelerometers to test winding installations doc. 3725/1/61, p. 9 (German text). Tests with accelerometers should be continued on a large scale.	C'	C'	-2)	-2)	-	-	-	-	?	E	C'	C'
Use of accelerometers should be extended.	C'	C'	-2)	-2)	-	-	-	-	?	E	C'	C'
VII - Recommendation regarding the consulting of foreign experts in the case of rescue operations connected with major mining accidents (doc. 4364/61/3).												

1) in respect of long-term tests.
2) trials to improve electro-magnetic testing methods are underway.
3) measurements are taken in individual cases.
4) electro-magnetic testing of cables is required in certain exceptional cases in the General Mines regulations.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
In certain serious mining accidents advice requested by the leaders of the rescue operation from qualified foreign experts in mine-rescue matters.												
The heads of Mine Rescue Stations are provided for this purpose with a plan containing the most important addresses and information needed.	C'1)	C'1)	C'1)	C'1)	C'1)	C'1)	C'1)	C'1)	A 2)	C'	C'1)	C'1)
This plan should be constantly kept up-to-date.	C'1)	C'1)	C'1)	C'1)	C'1)	C'1)	C'1)	C'	A 2)	C'	C'1)	C'1)
VIII - Report on firedamp-proof electrical equipment for nominal voltages above 1,100 volts (doc. 2400/64/1)												
1. What use has been made of the information contained in this report, and, in particular, to whom was it distributed?	Since, to all intents and purposes, only low-oil or oil-less switchgear is being used up to the present in new plant, no special use has been made of the information. It is for this very reason that no further research is being envisaged.		The information has been distributed to the department responsible for electrical equipment at the Technical Supervision Centre for mining equipment. No such research carried out in the Saar.		The report was published in "Annales des mines" and widely distributed. There are devices with satisfactory characteristics for use under specified conditions. – NRP – With regard to approval of these H.T. switchgear units.		NRP – Revision of the General regulations regarding use of electricity underground, especially in gassy and dusty pits, is in hand.		Nominal voltages over 1,100 volts forbidden.		NRP – Brought to the notice of all pits.	
2. The Working Party has noted that, in the Community countries, research into the development of low-oil or oil-less H.T. switchgear having the correct characteristics for use in gassy pits is being continued. What is the present position regarding this research and what data have been obtained to date?												
3. The Working Party has noted that oil is being used in respect of relays, and that research would be needed to reduce or eliminate the use of oil. What research is being carried out to this end?	3)	3)	4)	4)	?	?	5)	5)	5)	5)	4)	4)
4. This Report notes that switchgear specialists are trying to use less - or even no - oil with voltages above 1,100 volts and that, in particular, oil-less switchgear with separate poles, and low-oil switchgear, were being more and more widely used in most countries, at least for new plant.												

1) the main First-Aid Stations are in touch with the main Rescue Stations in the Community countries.
2) not applicable in the Sulcis coal-field.
3) trials with oil-less relays are underway.
4) no research of this kind is being carried out.
5) see above.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
These observations were deduced from practice during 1960 - 1962. What have been the trends since then?	1)	1)	2)	2)	3)	3)	4)	4)	4)	4)	2)	2)

1) this trend continues.
2) not applicable.
3) within certain limits, these devices may also be used elsewhere after the promulgation of the new regulations.
4) cf. p. II, 37.

II - HUMAN FACTORS

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
Recommendation on the fixing of climatic limits (the unabridget text is reproduced in doc. 3034/4/62)												
1.1 The basis is the American effective temperature (° eff basic scale).	C	C	C	C	C'	C'	A	A	E	NRP	C	C
Air velocities above 3 metres/sec should be considered as only 3 metres/sec in determining the American effective temperature.	C 1)	C 1)	C	C	C'	C'	-	-	E	NRP	C	C
1.2 The temperature data must be given so as to make possible a comparison on the basis indicated under 1.1.	C	C	C	C	C'	C'	-	-	E	NRP	C	C
1.3 The climatic limits determined shall be maximum values.	C	C	C	C	-	-	-	-	E	NRP	C	C
More favourable climatic values for the workers shall remain unchanged.	C	C	C	C	-	-	-	-	E	NRP	-3)	- 3)
1.4 There will be further investigation into the effectiveness and accuracy of the various climatic indices.	?	?	-	-	-	-	-	-	E	NRP	-3)	- 3)
2. Determination of a maximum climatic value												
2.2 Work on location is forbidden in working places where the temperature exceeds 32° eff A (basic scale), excepting the cases named in 2.3 and 2.4.	C	C	C	C	-	-	2)	2)	E	NRP	C	C
2.3 An exception can be made to the ban on working on location in temperatures above 32° eff A (basic scale) if the competent authority has given permission and the workers in question have been medically examined.												
In this case the following conditions must also be fulfilled:	C 4)	C 4)	C	C	-	-	A	A	E	NRP	C	C
2.3.1 The responsible authority can only issue permission for a fixed period and for given working operations.	C	C	C	C	-	-	A	A	E	NRP	C	C
2.3.2 The work must be carried out under medical supervision.	C	C	C5)	C 5)	-	-	-	-	E	NRP	C	C
Guidelines must be worked out, in collaboration with medical experts, covering the medical examination envisaged under 2.3.	C	C	-	-	-	-	-	-	E	NRP	C	C

1) 3,5 metres/sec.
2) working points where the temperature reaches 28°C are considered as particularly hot (without this being an absolute maximum value).
3) not applicable.
4) for mine rescue personnel.
5) medical supervision obligatory.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Netherlands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
2.3.3 Work must not continue uninterrupted for more than one hour. A suitable break must then be arranged in a better "climate".	C	C	C	C	-	-	A	A	E	NRP	C	C
The duration of uninterrupted working time, as well as the duration and frequency of the breaks and the climatic range in which this break is spent, as also all other necessary provisions are to be laid down in writing by the competent authority together with the responsible doctor before the work begins.	C 1)	C 1)	C	C	-	-	A	A	E	NRP	C	C
2.3.4 Acclimatised persons must be chosen. Persons over 40 years of age should not be put to this work.	C	C	-	-	-	-	-	-	E	NRP	C	C
Persons under 21 and over 45 years of age must not be put to this work.	C	C	C 2)	C 2)	-	-	-	-	E	NRP	C	C
2.4 An exception can also be made to the ban on working on location in temperatures above 32° eff A (basic scale) if danger threatens or in special circumstances calling for immediate action.	C	C	C	C	C'	C'	C 3)	C 3)	E	NRP	C	C
In such case, however:												
2.4.1 The competent authority and the responsible doctor must be immediately informed.	C	C	C	C	C'	C'	A	A	E	NRP	C	C
2.4.2 This work must be performed as soon as possible under the conditions listed in 2.3.1 to 2.3.4.	C	C	C	C	C'	C'	C'	C'	E	NRP	C	C
3. Climatic range between 32° eff A and 28° eff A (basic scale)							4)	4)				
3.1.1 Only persons shown by medical examination to be suitable can be employed in this climatic range.	A	A	C'	C'	-	-	C	C	E	NRP	C'	C'
The medical examination must pay particular attention to the heart and to blood circulation.	A	A	C'	C'	-	-	C	C	E	NRP	C'	C'
Persons continually employed in this climatic range must be examined medically at least once a year.	A	A	-	-	-	-	C	C	E	NRP	C'	C'
In addition, the following provisions apply:												

1) laid down generally in the mine rescue plans.
2) no provision made for excluding persons below 21 years of age from exceptional hot work.
3) ... ban on work on location in excessively high temperatures ...
4) range of climatic conditions above 28°C.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968	1.1. 1966	1.1. 1968
3.1.2 As soon as a working-point reaches a temperature above 28° eff A (basic scale) the competent authority must be informed in writing.	A	A	C 1)	C 1)	-	-	A	A	E	NRP	C	C
3.1.3 The lenght of stay in the climatic range between 30° and 32° eff A (basic scale) is restricted to 5 hours, and in the range between 28° and 30° eff A (basic scale) to 6 hours.	A	A	C 2)	C 2)	-	-	A	A	E	NRP	C	C
	A	A	C	C	C'	C'	A	A	E	NRP	C	C
3.1.4 For work in a climatic range between 28° and 32° eff A (basic scale) a method of payment corresponding to these conditions must be applied to eliminate any overloading.	A	A	A 3)	A 3)	-	-	C'	C'	E	NRP	C'	C'
3.1.5 The provisions quoted in 3.1.3 and 3.1.4 apply to all persons who, during one shift, have to work more than half the time of that shift in one of the climatic ranges mentioned above.	A	A	C	C	-	-	A	A	E	NRP	C'	C'

1) if 30° eff A (basic scale) is reached or exceeded, the Mines Inspectorate must be informed.
2) six hours.
3) must be arranged by tariff, outside the intervention of the Mines Inspectorate.

C - Regular report on the implementation of the Mines Safety and Health Commission's Recommendations published in the Fourth Report

HUMAN FACTORS

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Netherlands	
	1.1.1968		1.1.1968		1.1.1968		1.1.1968		1.1.1968		1.1.1968	
I. Recommendations on the psychological and sociological factors affecting safety (3rd report of the Mines Safety Commission, p. 425).												
1. Measures which will make it possible for workmen to recognise dangers and to carry out their work in such a way that these dangers are avoided												
1.1 Recognising dangers												
1.1.1 Before starting work in a district, a section of a working or a working-point and before any planned major change in the manpower deployment or in working conditions, it is important to check all the safety precautions to meet any dangers to be encountered.	C		C		C'		C		C'		C'	
1.1.2 During the work, regular reports on the following points must be prepared on the basis of the safety conditions which have to be observed under continuous supervision:												
a) changes in operating conditions					4)				C'[7]			
b) accidents or incidents					C				C'			
c) dangerous situations encountered during work	C[2] + C'1)		C+C'		5)		C'		C'		C'	
The data brought together in these reports should be systematically assessed with a view to improving or adapting the safety precautions in force.	C[2] + C'1)		C'		C'		C'		C'		C'	
1.1.3 After the work has been finished, the data assembled on the basis of daily experience should be used to prepare a report of experience	C'[3]		C'		6)		C'		8)		C'	
which should at least include information regarding the winning methods used,	C'[3]		C'		6)		C'		C'		C'	

1) laid down by the responsible authority for particular cases, otherwise generally included in the enterprise's manual.
2) laid down for accidents.
3) where new processes or materials are introduced.
4) no report is drawn up, verbal or written instructions given to the personnel concerned.
5) such situations are discussed at management or supervisor level, no report is drawn up.
6) no report is drawn up although account is taken of experience gained.
7) as regards the pattern of work and not actual operations as mentioned in the text.
8) not only when work is finished but in any case either weekly, monthly or annually.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
the dangers which have arisen and the precautions taken to deal with them,	C'[1]		C		2)		C'		C'		C'	
together with any accidents, incidents and dangerous situations which have occured during the working operations.	C'[1]		C		2)		C'		C'		C'	
1.2 Making known the dangers to all concerned												
1.2.1 Before starting work in a district, a section of a working or a working-point or in the event of a major change in the operating conditions, it is advisable to arrange a discussion between representatives of the management, supervisory staff and members of the safety services as well as the workers concerned or their representatives, in order:												
- to inform each individual with regard to the work envisaged												
- to study in detail the work to be carried out												
- to settle upon the method of work	C'		C'		3)		C'[4]		C'		C'	
1.2.2 The workers concerned should be informed by the most appropriate means of the method of work chosen.	C		C		C'		C		C'		C'	
1.2.3 During the execution of the work, the management and the supervisory staff should refer to the regulations and instructions to be observed as often as necessary to counteract the effects of habit.	C		C		C'		C		C'		C'	
1.2.4 If it is considered necessary to issue new safety instructions, these should be brought regularly to the notice of every worker concerned.	C		C		C'		C		C'[5]		C'	
1.2.5 Reports made by each of the workmen regarding dangerous situations which arise during the work should be brought to the notice of the management staff.	C'		C		C'+C		C'		C'+C		C	

1) where new processes or materials are introduced.
2) no report is drawn up, although account is taken of experience gained.
3) this takes place at engineer or supervisor level, or even af Safety Committee level, but not at meetings where all the people mentioned are present.
4) workers' safety representatives may give their opinion and submit their observations in the form provided for in the labour legislation.
5) by means of service instructions issued by the management of the mine, or of service notes issues by departmental heads and supervisers.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
1.3 Instruction in the manner in which the work is to be carried out without danger												
1.3.1 Every worker assigned to underground work must be able to show that he has:												
- a general training as an underground worker;	C		C		C' 3)		C'		4)		C	
- a special training for the work to which he is to be assigned;	C 1)		C		C'		C'		4)		C	
- the necessary additional training to cover the special working conditions at the point where he will work.	C		C		C'		C'		4)		C	
1.3.2 Should there be a change in the work or in the working conditions, the necessary additional training must be provided.	C' 2)		C		C'		C'		C'		C'	
1.3.3 Instruction in safety precautions is to be considered as an integral part of vocational training.	C		C		C'		C'		C'		C'	
1.4 Supervision to check that safety regulations are observed during work												
1.4.1 During the work, the safety conditions must be subject to continual supervision.	C		C		C		C		C'		C	
1.4.2 The duty to see that safety regulations are observed, and the responsibilities resulting from this duty, fall upon the management and supervisory staff.	C		C		C		C		C		C	
1.4.3 The supervision, which must be exercised with authority, should in its every-day action seek to improve the training and education of the workmen on the basis of daily experience, and should give rise to fines or penalties only in very serious or repeated cases of infringement.	C +C'		C'		C'+ 5)		C'		C'		C'	
2. Training the management and supervisory staff in the matter of safety												

1) laid down for particular cases, e.g. ventilation specialists, locomotive drivers and winch operators.
2) laid down by the responsible authorities for particular cases, otherwise generally included in the enterprises manual.
3) convention of the Joint National Mines Commission.
4) systematic training courses were provided up to 1963. After 1963, no new staff were engaged and therefore apprenticeship and training are only provided where new machinery and equipment is introduced.
5) concerns the last part of the sentence: "... and should give rise ...".

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
2.1 General												
2.1.1 Steps must be taken to ensure that the supervisory staff does not change posts frequently.	C'		A[2]		C'		C'		?		C'	
2.1.2 The vocational training should be adapted to the particular features of the staff member's task and his responsibilities, and in particular to the requirements of his place in the hierarchy of management or supervisory staff.	C'[1]		C		C [3] +C'		C'		C+C'		C'	
2.1.3 The transition from one grade to another should be possible for a given person only after he has actually proved to have the required knowledge and skill.	C'[1]		C		C'		C'		C'[4]		C'	
2.2 Guidelines for the vocational training of the management or supervisory staff												
2.2.1 The management and supervisory staff must have an adequate knowledge of:												
- the safety regulations;	C		C		C'		C		C'		C	
- the safety precautions to be taken;	C		C		C'		C		C'		C	
- the available safety equipement and its use;	C		C		C'		C		C'		C	
- the instructions in force for the different vocational groups whose work they are called upon to supervise, and the instructions for the exercise of activities at the working points for which they are responsible.	C		C		C'		C		C'		C	
2.2.2 The management and supervisory staff must be able:												
- to point out in a suitable way to the workers under their orders the dangers associated with their work;	C'		C		C'		C		C'		C'	
- to instruct these workers as to how best to carry out the work in order to avoid these dangers.	C'		C		C'		C'		C'		C'	

1) where certain supervisers are not recognised by the responsible authorities, the responsibility for carrying out this recommendation is left to the managing director of the mine.
2) cannot be laid down in the form of a regulation.
3) for the shotfirer.
4) by limited competition in the E.N.E.L. (Ente Nazionale per l'Energia Elettrica).

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
2.2.3 The management and supervisory staff should be trained in how to issue instructions.	C'		C'		1) C'		C'		2) C'		C'	
2.2.4 Special attention must be paid to the continual further training of all management and supervisory staff.	C'		C'		C'		C'		C'		C'	
2.2.5 The management and supervisory staff must both:												
- account for and report on the execution of their work, and	C'		C'		C'		C'		C'		C'	
- account for and report on all accidents and other notable incidents which have occurred during the working period at the points for which they are responsible.	C		C'		C'		C'		C		C'	
2.2.6 The management and supervisory staff must be able:												
- to draw up accident reports correctly;	C		C'		C' 3)		C'		C'		C'	
- to assess and use the data in these reports;	C'		C'		C' 3)		C'		C'		C'	
- to study and establish the causes of accidents;	C'		C'		C' 3)		C'		C'		C'	
- to work out means to avoid accidents;	C'		C'		C' 3)		C'		C'		C'	
- to receive the training necessary to this end.	C		C'		C' 3)		C'		C'		C'	
2.3 Staff responsible for training												
2.3.1 The staff responsible for the training activities set out in paragraphs 1.3 and 2 must be numerous enough and must have available the necessary means and time to carry out their task properly.	C		C		C'		C'		4)		C'	
2.4 Drawing up of an accident report; training of staff responsible for filling in such reports												

1) for the management staff. No systematic training in management for other grades.
2) this is not considered as a subject for training. Preference is given to constant supervision of the staff.
3) for the management staff. For supervision staff in certain cases only.
4) systematic training courses were given up to 1963. After 1963, no new staff were engaged and therefore apprenticeshop and training are only provided where new machinery and equipment is introduced.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
2.4.1 The accident report must, taking into account all the appropriate human and technical factors, give all necessary information and in particular:												
- the circumstances, the consequences of the accident, the causes,	C		C		C		C'		C'		C'	
- the precautions proposed to avoid similar accidents	C		C		C		C'		C'		C'	
2.4.2 Each of these items of information referred to in point 2.4.1 must be capable of formulation as an answer to a clear and precise question.	C		C		C		C'		C'		C'	
2.4.3 The breakdown and layout of the form used for accident reports must clearly show which questions have to be answered by each of the members of the staff contributing to the preparation of the reports.	C'[1]		C		C		C'		C'		C'	
2.4.4 There must be sufficient room on the form for supplementary remarks or sketches which may be provided by the person or persons concerned.	C'[1]		C		C'		C'		C'		C'	
2.4.5 Each of the persons contributing to the preparation of the report must be informed with regard to:												
- the importance of each question,	C		C'		C'		C'		C'		C'	
- the way to provide correct answers to the questions.	C		C'		C'		C'		C'		C'	
2.4.6 Practical instruction should be provided to draw the attention of the employees concerned to the consequences of omissions, neglectful or unclear answers to the questions.	C'		C'		2)		C'		3)		C'	
2.4.7 Systematic attention should be paid to ensure that the answers are complete, accurate and precise.	C		C'		C		C'		C'		C'	
2.4.8 The accidents reports referred to in this chapter are to be drawn up for the sole purpose of accident prevention.	C'		C'		C'		C'		C'		C'	

1) the form used by the professional mining organisation does not comply entirely with this provision.
2) does not exist.
3) systematic training courses were given up to 1963. After 1963, no new staff were engaged and therefore apprenticeship and training are only provided when new machinery and equipment are introduced.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
2.5 Appointment and promotion of management or supervisory staff												
2.5.1 Care should be taken to ensure that there is available an adequate number of management or supervisory staff possessed of the requisite skills both in the technical and safety fields.	C+C'		C		C+C'		C'		C+C'		C'	
2.5.2 The selection of this staff is the responsibility of the employer, who must at least inform the competent authority of the persons entrusted with supervision of working operations, together with the necessary data justifying the selection.	C		C		C		C[2]		C+C' 3) A		C	
2.5.3 To ensure a selection which promises success, there should be laid down the minimum requirements for appointment to a post in one of these categories, either by direct appointment or by promotion, together with the certificates and other documents which are the necessary requisite for such an appointment.	C'		C		1)		C'		4) C		C	
2.5.4 The competent authority should be in a position to check the knowledge and skills of the management or supervisory staff - both from the human and technical points of view - should this authority consider it necessary, at least in the case of a major failure or of repeated failures in the performance of duties.	C		C		6) C		A		A		C	
3. Usefulness of psycho-technical examinations												
3.1 On assignment												
3.1.1 It is recommended that the application of a relatively simple psycho-technical examination upon assignment should be developed as far as possible, in order to:												
- determine the general intellectual level of the candidate;	5) A		C		7) C'		C'		C+ 8) C'		C'	
- to exclude those candidates whose intellectual level lies below a pre-determined minimum.	C		C		7) C'		C'		8) C'		C'	

1) does not exist in practice.
2) the managing director of the mine informs his chief engineer of the name of the departmental head in charge of technical matters.
3) as regards the reasons for the choice.
4) the law lays down a provision concerning the academic qualifications of directors and departmental heads.
5) psycho-technical examinations are required for certain duties only (winding-enginemen, locomotive drivers). Other enterprises have these types of examination for other duties.
6) for the shotfirers.
7) this ceased when recruitment was discontinued.
8) cf. 3) on previous page.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
3.2 Before the exercise of specific duties												
3.2.1 In every instance, the workmen who are to be made responsible for the execution of particular working operations, - with which there is associated a particular responsibility in respect of collective safety or - which call for particular intellectual or personality characteristics should be subjected to a special psycho-technical examination to determine whether they have the capacities required for this activity.	1) C		2) C + E		3) C'		C'		E		C	
3.2.2 The competent authority must, in co-operation with the representatives of the employers and employees, keep up to date the list of work for which those special examinations are to be prescribed and, to this end, should list the duties which have been shown by experience to call for such tests and for which such tests can in practice be carried out.	1) C		E		4)		A		E		C'	
3.3 Before any promotion of a worker to a supervisory post												
3.3.1 Before the promotion of any workman to a supervisory post, a suitable psycho-technical examination must be carried out.	1) A		5) A		6) C		C'		E		C'	
3.4 Principles underlying the various psycho-technical examination												
3.4.1 The psycho-technical examinations listed under 3.2 and 3.3 should, as far as possible, aid the vocational specialisation of the worker in question.	1) A		C		C'		C'		7)		C'	

1) cf. 5) on previous page.
2) for winding-enginemen and locomotive drivers.
3) ceased when recruitment was discontinued.
4) does not exist.
5) eligibility for promotion within the supervisor grade is determined during the vocational training laid-down by the responsible authorities.
6) when there was in fact a psychological department.
7) systematic training courses were given up to 1963. After 1963, no new staff were engaged and therefore apprenticeship and training are only provided when new machinery and equipment are introduced.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
3.4.2 The management must lay down the criteria which have to be met by the candidate on assignment, or later, when directed to special tasks,	(1) A		E		C'		C'		C'		C'	
and must seek the advice of psychologists when so doing.	1) A		E		C'		C'		C'		C'	
3.4.3 The psychologist's assessment will be valid only for a restricted period and must be compared with the assessments of the vocational behaviour of the person in question.	1) A		E		2) C'		C'		E		C'	

(1) psycho-technical examinations are required for certain duties only (winding-enginemen, locomotive drivers). Other enterprises have these types of examination for other duties.
(2) when there was in fact a psychological department.

GENERAL REMARKS ON IMPLEMENTATION BY ITALY

It should be noted that, pursuant to Article 23 of the Mining Regulations in force, the subject referred to above has been included in the collective agreements.

The Italian coalmines, which as is well known, are only worked in the Sulcis (Sardinia) coalfield, have been for some time placed under the control of the "Ente Nazionale per l'Energia Elettrica (E.N.E.L.)", since their total production are intended for the Porto Vesme (Cagliari) thermal plants. The staff in these mines benefit from the guarantees given by the collective agreement applicable to workers in the electricity sector, which is among the most favourable collective agreements at present in force in Italy. In particular, this agreement excludes piecework and, consequently a negative answer should be given to the questionnaire as regards the application of the recommendation concerned or, in any case, the latter should be considered as not complying with the de facto situation.

For the sake of covering all contingencies, however, it was considered advisable to include the rather improbable possibility of new coalmines being opened, which are not directly linked with the production of electrical energy, and to answer the questionnaire on the basis of the collective agreement of 13 May 1967 which is applicable in the mining industry.

It should also be noted that, from page 54 onwards of the questionnaire concerned, the symbol "C" and other symbols used in the answer refer to clauses of the collective agreement mentioned above and not to standards codified in the form in legislation or regulations.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Netherlands	
	1.1.1968		1.1.1968		1.1.1968		1.1.1968		1.1.1968		1.1.1968	
II. Recommendations as to principles to be observed in view of the possible influence of payment at piece rates on safety in coalmines (4th report of the Mines Safety and Health Commission, Annex IV)									(cf. general remarks on previous page)			
1. Piecework arrangements	1)								4)			
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	C		C		C		NRP		C[5]		C	
- have undergone a medical examination to establish his fitness for such work.	C[2]		C		C		C		C[5]		C	
1.1.2 Similar examinations must follow at regular intervals.	C'[2]		C[3]		C		C		C[5]		C	
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.	C'[6]		C'		C'		C		C'		C'	
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	-		-		C'		-		C'		C'	
- contain equivalent financial safeguards for the proper execution of such operations.	C'[6]		C'		C'		C'		C'		C'	
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.	C'[6]		C'		C'		C		C		C	

1) Questions relating to pay cannot be dealt with by the responsible authorities. Such questions are settled by means of collective agreements.
2) all workers are subjected to medical examinations when taken on and to similar examinations at regular intervals.
3) periodic X-ray examinations (every 15 months at most). Periodic clinical examination only where signs of pneumoconiosis are detected or on medical advice.
4) pursuant to Article 23 of the Mining Regulation in force, this question was the subject of collective agreements. Consequently, from page 2 onwards of the questionnaire, the symbols used refer to clauses of the collective agreement of 13 May 1967.
5) pursuant to the Mining Regulation and to the provisions relating to young workers.
6) settled by collective agreement.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
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 the employer.	1) C'		C'		C'		C		C		C	
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) C'		C'		C'		C		3)		C	
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.	2) A		C'		?		C'		C'		C	
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;	1) C'		C'		C'		C		C'		C	
the amount of work the men can fairly be expected to perform during this time, having regard to the working conditions;	1) C'		C'		C'		C		E		C	
the amount of time required to perform the operations properly.	1) C'		C'		C'		C		C'		C	
1.6 Calculation of the end wage												
1.6.1 The basis and mode of calculation must be sufficiently simple for any worker to be able to work out for himself the sum due him for a given period.	1) C'		C'		C'		C		C'		C'	
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,	1) C'		C'		C'		C		C'		C	
and that the findings be duly notified to the men concerned.	1) C'		C'		C'		C		C'		C	

1) settled by collective agreement.
2) for certain operations, one-man piecework is considered by both sides to the agreement as the most appropriate type of remuneration.
3) the collective agreement does not provide for conciliation procedures, although such procedure exists and the Ministry of Labour and Social Security acts as an arbitrator (whose decisions are not binding).

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Netherlands	
	1.1.1968		1.1.1968		1.1.1968		1.1.1968		1.1.1968		1.1.1968	
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.	1) C'		C'		C'		C		C'		C	
2. Changes in conditions at the workplace												
2.1 A piecework arrangement may be terminated or amended if the employer and the men are agreed that genuine difficulties warranting this course have been objectively found to exist.	1) C'		C'		C'		C		C'		C'	
Failing such agreement, the men must have the right to ask nevertheless that the arrangement be terminated or amended forthwith.	1) C'		C'		C'		C		2) C		C	
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.	1) C'		C'		C'		C		3) C		C	
3. Managerial and supervisory staff												
3.1 In the interests of safety, extra supervision must be provided in workings where men are employed on piecework.	C'		C'		?		C'		C'		C'	
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 and relevant instructions to this effect, and check regularly to see that these are carried out.	C'		C'		C		C		C'		C	
3.2 Payment of managerial and supervisory staff												
3.2.1 Since managerial and supervisory staff are responsible not only for the organisation and smooth running of operations, but also												

1) settled by collective agreement.
2) provided for in agreements at provincial and enterprise level.
3) the collective agreement guarantees minimum pay and ancillary allowances.

Recommendations by the Commission	N.R./Wph.		Saar		Belgium		France		Italy		Nether-lands	
	1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968		1.1. 1968	
for the safety of the men engaged in them, they should as a rule be paid out on a basis independent of the ups and downs of production.	1) A		C'		C		C		C		C'	
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.	1) A		C'		C'		C		C		C'	
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.	2) C'		C'		C'		C		3)		C	
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.	2) C'		C'		C'		C		3)		C	
4.1.2 The fact that proceedings of this kind are pending must not affect the terms of employment of the men concerned,	2) C'		C'		C'		C		C'		C	
who must continue to be entitled to a fair wage appropriate to their grade.	2) C'		C'		C'		C		C		C	

1) cannot be the subject of Mines Authority prescriptions. Settled according to area.
2) settled by collective agreement.
3) systematic training courses were given up to 1963. After 1963, no new staff were engaged and therefore apprenticeship and training are only provided when new machinery and equipment are introduced.

ANNEX III

LIST OF REPORTS BY THE WORKING PARTY ON COMBUSTIBLE DUSTS

1) Memorandum on useful data for the study of dust explosion accidents in the Community and the United Kingdom.

2) Survey of typical accidents due to coaldust explosions over a ten-year period in the Community and the United Kingdom, and comments thereon.

3) A bibliographical study of research work on the subject of dust barriers in the Community and the United Kingdom.

4) A Community experimental programme relating to dust barriers.

5) A joint system of reports on experiments carried out in the Community and the United Kingdom concerning the testing of barriers for the prevention of coal-dust explosions.

Copies of these reports may be obtained from the secretariat of the Mines Safety and Health Commission.

ANNEX IV

TERMS OF REFERENCE OF THE VARIOUS WORKINGS PARTIES OF THE MINES SAFETY AND HEALTH COMMISSION

I. Working Party on Electrification - Chairman M. LOGELAIN

A. Terms of reference

1. Comparing adopted safety and accident prevention provisions relating to:
   (a) electric shock,
   (b) fire hazard,
   (c) explosion hazard.

2. Ascertaining the present position in Community countries with regard to safety regulations on underground electrical networks of low and medium voltage (up to 1,100 V) and feeder cables for movable equipment, with due regard to the specifications for the said cables.

3. Reporting on steps to be taken when work has to be carried out on electrical equipment under voltage.

4. Studying the deleterious effects on electrical equipment used underground of moisture in salt pastes and salt pastes used in dust suppression.

5. Studying the construction of high-tension cables (of up to 6,000 V) used underground, and protective equipment.

B. Preliminary work to be undertaken by the Secretariat

1. Comparison of safety provisions relating to underground electric locomotives, with emphasis on the possibility of reducing the frequency of trolley wire sparking.

2. Periodic reports on oil-powered contactors used in gassy environments.

3. Investigation of the use of remote-control circuits in automated mining operations.

4. Study of over-voltage caused by lightning and the problem of stray currents.

II. Working Party on Rescue Arrangements, Fires and Underground Combustion - Chairman Mr. HELLER

General terms of reference (Section 7 of the Mines Safety and Health Commission's Terms of Reference)

Exchange of information on rescue work and fire-fighting in connection with accidents of interest to the Working Party.

A. Underground combustion

Terms of reference

1. Continuing the study of the problem of fire-fighting in very deep pits, if necessary with the help of small-scale model tests and full-scale experiments, should a favourable opportunity arise.

2. Continuing the study of the problem of sealing off fire and ventilation stoppings, as well as roadway walls, by means of urethane foam. Examining this question so that in the event, suitable proposals may be submitted to the Mines Safety and Health Commission.

3. Continuing the study of specifications and test conditions applicable to fire-resistant fluids:

(a) comparing test results so as to prevent products being differently assessed;

(b) where necessary, adapting test criteria to technological progress;

(c) in addition, examining to what extent it might be possible to relax these criteria and test methods so that the products may be more easily assessed and approved.

4. Studying the stabilisation of ventilation in the event of pit fires in accordance with Professor BUDRYK's theory, and any practical conclusions to be drawn from it with reference to Community mines.

   This item to be extended to cover general ventilation problems in view of their special bearing on fires.

5. Exchanging views on the reopening in the Community and the United Kingdom of stoppings of fire zones, and where necessary to adapt regulations already drafted.

6. The early detection of underground combustion and rapid provision of air-tight stoppings.

   Studying technological advances in these spheres in both the Community and the United Kingdom.

7. Drawing up a synoptic comparison of the rules and regulations relating to the prevention and control of underground combustion, as drafted by the mining authorities of the Community and of the United Kingdom.

   The practical application of experience gained in this field.

B. Rescue Arrangements

Terms of reference

1. Communication of the annual reports issued by the rescue stations and regular discussion of these documents.

2. Convening meetings on special occasions (accidents from which new information can be gained, technical innovations in materials, equipment, etc.).

3. The publication every two years of a report outlining in particular the situation as regards rescue organisations in the Community and the United Kingdom.

4. Improvements in respirators used by rescue workers.

5. Improvements in self-rescuers.

6. Exchanges of view on the use of smoke powders to simulate smoke in practice galleries.

7. Listing of materials for use in special rescue operations.

8. Examination of the technique for rescuing trapped miners by means of large boreholes with a view to formulating rules based on experience gained in different countries and submitting practical regulations to the mining authorities.

9. Drawing up of a synoptic comparison of the rules and regulations relating to rescue arrangements and medical assistance, as drafted by the mining authorities of the Community and of the United Kingdom.

   The practical application of experience gained in this field.

10. Studying of the Community criteria for fireproof clothing and general requirements.

III. Working Party on Winding Ropes and Shaft Guides - Chairman Mr. MARTENS

Terms of reference

1. Follow-up of progress made in the electro-magnetic testing of winding ropes so as to obtain information on their use in Community mines.

2. Testing of couplings for circular strand and flattened-strand winding ropes.

3. Arrangements for the installation of capels.

4. Control of shaft guides by means of automatic error detectors.

5. Maintenance required to ensure safe operation of winding ropes and balance ropes.

IV. Working Party on Mining Accident Statistics - Chairman Mr. REBIERE

Terms of reference

Examination of the methods used in Community countries for establishing mining accident statistics. Particular examination of the criteria applied in defining the term "mining accident" and the criteria used in classifying the accidents according to cause, duration of stoppage and site of lesions.

With the exact definition of these criteria as a basis, establishing differences between the statistical elements assembled in each country and ways of taking these differences into account in possible comparisons on a Community level.

V. Working Party on Combustible Dusts - Chairman Mr. SCHNEIDER

Terms of reference

With due consideration of the mechanism of dust combustion and flame propagation, carry out a study of precautions against dust combustion, particularly:

(a) dust barriers (different types of dust barriers, their construction, siting, etc.). Where necessary, make suggestions for research work is considered necessary for a better understanding of the phenomena studied and the promotion of safety in these fields;

(b) dust neutralisation (dust control in situ, stone-dusting, spraying, dust fixation by spreading salts and coagulating pastes, etc.).

VI. Working Party on Health in Coal Mines - Chairman Mr. VANDENHEUVEL

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

A. Terms of reference

1. Where necessary, making recommendations on means of dust control, and general measures to reduce dustiness in underground workings, recognised as being to some extent effective (wet drilling, water infusion, spraying, special attachments to winning machines, pulsed-infusion shotfiring, etc.);

2. Where necessary, making recommendations on the organisation of specialised dust-control services.

B. Preliminary work to be undertaken by the Secretariat

The assembling of documentary material and comparison of legislation in the various Community countries with reference to:

1. General rules covering the prevention of dust in respect of the design and use of winning machines; standards to be observed to ensure minimum dustiness arising from the use of these machines.

2. Dust measurement (methods, frequency, measuring points, conclusions to be drawn etc.) and where necessary establishing a scale of comparison of the various methods employed.

3. Establishment of dustiness tresholds. Definition of categories of permissible dustiness. Steps to be taken when faced with various categories of dustiness.

VII. Working Party on Effects of Working Time on Safety at Work, especially in Difficult or Unhealthy Conditions - Chairman Mr. VAN DER HOOFT

Provisional Terms of reference (definitive text to be submitted to the Restricted Committee):

Number of hours worked in wet working points. Determining in what cases a working point is to be considered wet and the precautions to be taken.

VIII. Working Party on Psychological and Sociological Factors affecting Safety - Chairman Mr. SCHNASE

Terms of reference

1. Safety campaigns.

2. A draft recommendation on the employment of foreign and young workers.

SIXTH REPORT OF THE WORKING PARTY ON MINE RESCUE AS REGARDS THE ORGANISATION OF MINE RESCUE SERVICES IN 1965 and 1966

S U M M A R Y

INTRODUCTION

I. The present Report relates to 1965 and 1966.

During this period the situation in the coalmining industry led to a further reduction in the number of first-aid workers. With the exception of the Saar, the Nord/Pas-de-Calais and Sulcis coalfields, this observation applies to every coalfield covered by the present Report.

The total number of first-aid workers in the Community and the United Kingdom fell from 12,820 in 1964 to 11,560 in 1966, i.e. 10%; for underground workers, however, the percentage rose from 15.5% to 16.6%, i.e. 7%.

II. The Working Party on Rescue Arrangements did not confine its attention to the problems outlined in the Fifth Report but during this period found it advisable to hold a number of meetings at the main Rescue Stations (the previous meetings of this kind were held over 7 years ago).

As is known, the 1958 and 1959 visits resulted in the drafting of the First Report on rescue arrangements in mines.

The object of such visits is to permit an exchange of views on the use of new equipment and materials, to gain first-hand information on new processes and methods used in the most widely different sectors of the rescue organisation and also to establish personal contact with experts who are not members of the Working Party.

In 1966, the Working Party held meetings at the Essen-Kray and Mansfield Rescue Stations. At Essen-Kray, the discussion dwelt mainly on the following problems and practical matters:

(a) the organisation of rescue work in the Ruhr and the tasks of the Central Rescue Station, with emphasis on changes introduced since the last visit in 1958;

(b) the technique for rescuing trapped miners by means of large boreholes;

(c) a demonstration of devices and equipment specially adapted for rescue work, particularly the most recent models (particularly lightweight closed-circuit breathing apparates using oxygen, new CO-recording devices, etc.);

(d) a visit to the laboratory and a demonstration of equipment for testing CO-filter self-rescuers;

(e) revival training, particularly by means of the mouth-to-mouth method, pulsating motor method and cardiac massage method;

(f) organisation of the medical aid service;

(g) alerting the medical aid service in co-operation with the army.

The Mansfield talks were mainly on the following subjects:

(a) plaster stoppings, increasingly used when a fire or explosion hazard exists, as being sturdy, rapidly constructed and safe;

(b) demonstration of a mobile TV studio to be used as an aid in rescue operations and in the training of rescue men;

(c) demonstration of a mobile winning device for use in the event of a breakdown of the winning machines;

(d) inspection of an up-to-date mobile scientific laboratory for quick on-the-spot analyses of gases:

(e) demonstration of a vacuum/pressure impregnation plant for the fire-retardant treatment of mining timber;

(f) demonstration of new types of rescue equipment and self-rescuers.

Further visits are being made. The documentation distributed on these occasions has been translated and, together with the reports, provides information on the present position of the subjects dealt with.

III. The following is a list of reports on the organisation of rescue work published to date:

1. Report on visits to the rescue stations in the Community and the United Kingdom (published in the Mines Safety and Health Commission's Second Report, Annex B).

2. Second Report on the organisation of Mine Rescue Services as at 1960 (published in the Mines Safety and Health Commission's Third Report, Annex V a).

3. Third Report on the organisation of Mine Rescue Services as at 1961 (published in the Mines Safety and Health Commission's Third Report, Annex VI A).

4. Fourth Report on the organisation of Mine Rescue Services as at 1962 (published in the Mines Safety and Health Commission's Third Report, Annex VII a).

5. Fifth Report on the organisation of Mine Rescue Services as at 1963-1964 (published in the Mines Safety and Health Commission's Third Report, Annex VIII a).

A. ORGANISATION OF MINE RESCUE SERVICES

Position as at : 31.12.1966

1. Rescue Stations and Rescue Workers

Country	German Federal Republic			France		Belgium				Italy	Netherlands	United Kingdom	Total
Coalfield	Ruhr	Aachen	Saar	Nord/Pas-de-Calais	Lorraine	Borinage	Charleroi Namur	Liège	Campine	Sulcis	Limburg		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
a) Central Rescue Station (responsibilities)	Essen-Kray 1,2,4,5,6	Höngen-Mariadorf 1,2,4	Friedrichs-thal 1,2,3,4,6	Lens 1,2,4,6	Merlebach 1,2,3,4,6	Frameries 1,2,3,4,5,6	Marci-nelle 1,2,3,4	Glain 1,2,3,4,6	Hasselt 1,2,4,6	Miniera Seruci 1,2,4	(+)	(++)	
b) Number of rescue stations	82	6	13	52	9	1	1	1	7	1	11	A = 14 B = 12	204
c) Number of rescue men	4 563	291	719	660	564	121	260	198	285	16	555	3 328	11 560
d) Total underground personnel employed	163 426	15 865	22 407	67 620	20 422	6 714	12 458	7 562	27 958	873	21 367	326 970	693 642
e) Rescue men per 1000 underground workers	27.9	18.3	32.0	9.8	27.6	18.0	20.9	26.2	10.2	18.0	26.0	10.1	16.6

(+) Netherlands : there is no central rescue station in the Limburg coalfiels.

(++) United Kingdom : there is no national rescue station. In each coalfield, a separate Committee is responsible for the organisation of the rescue services and there is also a National Advisory Committee to the National Coal Board which deals with all aspects of rescue work, including scientific research.

Each rescue station usually serves mines within a 15-mile radius. They are subdivided into "Plan A" Stations and "Plan B" Stations.

*) Responsibilities

Reference number 1 = Organisation of rescue services
2 = Supervision of rescue men and rescue stations
3 = Permanent rescue brigade
4 = Training
5 = Co-ordination of safety equipment
6 = Research on rescue work

"Plan A" Stations : those having their own permanent rescue brigade whose members live on the station or nearby, they are assisted by a number of part-time rescue men in mines served by the station.

"Plan B" Stations : those not having permanent personnel and only operated by means of part-time rescue brigades attached to the mines.

A. ORGANISATION OF MINE RESCUE SERVICES

Position as at : 31.12.1966

2. Catalogue of equipment including closed-circuit breathing apparatus operating for a period of at least two hours

Country	German Federal Republic			France		Belgium				Italy	Netherlands	United Kingdom	Total
Coalfield	Ruhr	Aachen	Saar	Nord/Pas-de-Calais	Lorraine	Borinage	Charleroi Namur	Liège	Campine	Sulcis	Limburg		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Type of apparatus a) Dräger BG 160 A	958	74	263	-	128	26	14	22	84	42	106	-	1 717
b) Dräger BG 170/400	675	22	-	-	-	-	10	6	40	9	-	-	762
c) Dräger BG 172	707	19	29	-	37	19	26	20	14	-	48	-	919
d) Dräger 174	-	-	-	-	61	-	-	-	2	-	-	-	73
e) Auer MR II/32	76	2	-	-	-	-	-	-	-	-	10	-	146
f) Auer MR 54/400	46	1	-	-	-	-	-	-	-	-	68	-	47
g) Auer MR 56/400	41	1	-	-	-	-	-	-	-	-	-	-	42
h) Fenzy 56	-	-	-	400	13	-	-	-	5	-	-	-	418
i) Pirelli 45	-	-	-	-	-	-	-	-	2	-	-	-	2
j) BBM Aerecheon	-	-	-	-	-	2	-	-	2	-	-	-	4
k) BBM Aerophor	-	-	-	-	-	-	-	-	-	-	-	220	220
l) Proto	-	-	-	-	-	-	-	-	2	-	-	814	816
m) Savox	-	-	-	-	-	-	-	-	2	-	-	161	163
n) Normalair	-	-	-	-	-	-	-	-	-	-	-	-	-
o) Aerorlox	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2 503	119	292	400	239	47	50	48	153	51	232	1 195	5 329
Per group of 100 rescue men	54.8	38.0	41.0	60.6	42.3	38.8	19.2	24.2	54.4	320	41.8	35.9	46.1

Years : 1965 and 1966

B. NUMBER OF RESCUE OPERATIONS PERFORMED BY MEN WEARING

CLOSED-CIRCUIT BREATHING APPARATUS

Cause	Firedamp or dust			Outburst of natural gas			Pit fires			Underground combustion			Opening-up of stoppings			Miscellaneous causes			Total		
Coalfield	a)+	b)++	c)+++	a)+	b)++	c)+++	a)+	b)++	c)+++	a)+	b)++	c)+++	a)+	b)++	c)+++	a)+	b)++	c)+++	a)+	b)++	c)+++
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
1. Ruhr	3	4	75	-	9	133	2	15	8 395	-	27	8 931	-	14	1 311	-	22	1 197	5	91	20 042
2. Aachen	-	-	-	-	-	-	-	1	22	-	-	-	-	-	-	-	1	5	-	2	27
3. Saar	-	1	5	-	-	-	-	2	13	-	1	8	-	6	115	-	4	35	-	14	176
4. GERMANY	3	5	80	-	9	133	2	18	8 430	-	28	8 939	-	20	1 426	-	27	1 237	5	107	20 245
5. Nord/Pas-de-Calais	1	-	10	-	1	5	-	1	9	-	2	16	-	1	10	1	8	86	2	13	136
6. Lorraine	-	-	-	-	-	-	-	-	-	-	1	10	-	3	38	-	-	-	-	4	48
7. FRANCE	1	-	10	-	1	5	-	1	9	-	3	26	-	4	48	1	8	86	2	17	184
8. Borinage	-	-	-	2	1	8	-	-	-	-	-	-	-	-	-	-	-	-	2	1	8
9. Charleroi-Namur	1	-	5	-	2	27	-	-	-	-	-	-	-	-	-	-	-	-	1	2	32
10. Liège	-	-	-	-	4	4	-	-	-	-	-	-	-	-	-	-	4	-	-	8	4
11. Campine	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10	-	1	10
12. BELGIUM	1	-	5	2	7	39	-	-	-	-	-	-	-	-	-	-	5	10	3	12	54
13. ITALY (Sulcis)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14. NETHERLANDS (Limburg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15. UNITED KINGDOM	-	2	786	-	-	-	-	1	5	-	9	1 497	-	-	-	-	5	231	-	17	2 519
16. COMMUNITY + UNITED KINGDOM	5	7	881	2	17	177	2	20	8 444	-	40	10 461	-	24	1 475	1	45	1 564	10	153	23 002

a)+ = Rescue of personnel.

b)++ = Rescue of materials.

c)+++ = Number of air-purifying cartridges used in these operations.

C. ACCIDENTS TO RESCUE MEN DUE TO THE WEARING OF GAS-MASKS

1965 and 1966

COALFIELD	Serious accidents		During practice	
	not fatal	fatal	not fatal	fatal
(1)	(2)	(3)	(4)	(5)
1. Ruhr	-	-	-	-
2. Aachen	-	-	-	-
3. Saar	-	-	-	-
4. GERMANY	-	-	-	-
5. Nord/Pas-de-Calais	-	-	-	-
6. Lorraine	-	-	-	-
7. FRANCE	-	-	-	-
8. Borinage	-	-	-	-
9. Charleroi-Namur	-	-	-	-
10. Liège	-	-	4	-
11. Campine	-	-	5	-
12. BELGIUM	-	-	9	-
13. ITALY (Sulcis)	-	-	-	-
14. NETHERLANDS (Limburg)	-	-	-	-
15. UNITED KINGDOM	1	-	4	-
16. COMMUNITY + UNITED KINGDOM	1	-	13	-

D. COMMENTS, SUPPLEMENTARY INFORMATION, AND PRINCIPAL CHANGES COMPARED WITH 1963 and 1964

I. GERMAN FEDERAL REPUBLIC

1. Essen-Kray Rescue Station

(a) Re A 1. Rescue Stations and Rescue Parties

Owing to pit closures and the reorganisation of rescue brigades, the number of rescue stations administered by the main station at Essen has fallen to 82, but the number of rescue men has not been reduced in the same proportion.

When new mines regulations came into force for the "Oberbergämter" pits of Bonn and Dortmund, the previous rescue regulations were replaced by a "rescue plan" and new instructions were also issued to rescue workers.

The decrease in the number of rescue stations has also meant a reorganisation of the first-aid arrangements. The central rescue station drafted a new "first-aid plan for rescue work" which was published in 1966.

(b) Re B: Number of operations

There was no drop in the number of operations during the two years under review, but the percentage of operations in connection with fires and explosions shows a decline. Many operations were concerned with the inspection and opening-up of stoppings of fire zones, with outburst of natural gas or with the presence of noxious atmospheres.

Some fires reached exceptional proportions, particularly in 1965.

An explosion, which occurred while one fire was being fought, killed nine miners, six of whom were members of a rescue brigade, while five others were seriously injured.

At another fire fumes caused the death of two miners who were unable to escape in time.

All these operations are the subject of extensive comments in the annual reports published by the Essen Rescue Station. These reports are regularly sent to members of the Working Party for information.

(c) Re C: Accidents to rescuers due to the wearing of gas masks

In 1965 and 1966, no accidents occurred to rescue workers equipped with breathing apparatus.

(d) Research and development results

Breathing apparatus

The official examination of the new closed-circuit Dräger apparatus, model BG 174, was concluded at the Essen Rescue Station. All German "Oberbergämter" have authorised the underground and surface use of this apparatus which was approved by the "Deutscher Ausschuss für das Grubenrettungswesen".

After this organisation had duly examined the oxygen-operated SSR 16 B self-rescuer manufactured by the Auer Company, this apparatus was approved as an escape device for use in mines other than coalmines and as an "auxiliary apparatus for trained rescue brigades". The oxygen-operated self-rescuer

Oxy SR 45 manufactured by Messrs. Dräger has also been approved by the "Deutscher Ausschuss für das Grubenrettungswesen" as a surface and underground escape device and as an "auxiliary apparatus for trained rescue brigades".

During the period under review, work continued on the research project for the improvement of physiological conditions of wearers of breathing apparatus, a joint undertaking of the Institut Physiologique of the University of Liège and the Hasselt Central Rescue Station which is subsidised by the High Authority.

CO filter self-rescuer

The first filter self-rescuers fitted with a heat exchanger have been put into operation by pits administered by the Essen Rescue Station.

In 1965 and 1966, filter self-rescuers were used as an escape measure in ten cases of fire and explosion by a total of 303 miners.

The mining authorities have instructed the Essen Rescue Station to test the effects of the decomposition by fire of synthetic materials on filter self-rescuers. A special testing unit has been devised for these tests.

Control of fires and underground combustion

A new material known as "Dämmer" for packing fire dams has had a good reception. "Dämmer" replaces the mixture of rockdust and cement hitherto used. The material has also been successfully used for injecting cement into dams and roadway sides and roofs.

After exhaustive tests, plaster is now also being used for injection work. This method has produced some particularly good results because the plaster sprayed on the roadway has good sealing characteristics, and because it can, within a short time, be reinforced with slurry for improving the seal.

The Essen Rescue Station took part in a large number of fire trials in the Tremonia experimental mine, their object being to throw light on the behaviour of synthetic materials and fires in a descending ventilation system.

2. Friedrichsthal/Saar Rescue Station

(a) The following rules and regulations relating to rescue work and underground fire prevention have been either revised or reissued:

- Service regulations for fire deputies, 21.6.1965;
- Principles for the planning and execution of rescue operations in coalmines, 29.6.1965;
- Main rescue plan for the "Oberbergamt" district of Saarbrucken, 20.10.1965;
- Regulations and Directives on underground firefighting, issued by the Saarbrucken "Oberbergamt", 4.11.1965;
- Directives on the use of filter self-rescuers, issued by the Saarbrucken "Oberbergamt", 22.11.1965.

(b) The work of fitting all Saarbergwerke AG return shafts with CO measuring and warning equipment was completed during the period under review. A large-scale experiment was begun with underground CO measuring and warning equipment.

(c) As a precaution against concealed mine fires, the present fire regulations specify that, in the case of long-wall advancing working with the caving system, the roadway barriers to be made along the top and bottom roads should be sealed by sandbags parallel to the roadway axis. After several satisfactory trials, this sandbag seal was replaced by an insulating foamed seal. Under these conditions of use, this material gave good results.

(d) Rapid water barriers were introduced in all mines to replace the former rapid stonedust barriers set up for the protection of teams engaged on sealing work where an explosion hazard exists.

(e) The annual reports for 1965 and 1966, published by the Saarbergwerke AG Rescue Station on mine rescue operations and firefighting, have been distributed to the experts of the Working Party on Rescue Arrangements. These reports give detailed supplementary information on the problems discussed in paragraphs A, B and C of the present Report.

II. BELGIUM

1. Hasselt Rescue Co-ordination Centre

(a) Re A (1): Rescue Stations and Rescue Workers

Compared with the position on 31 December 1964, the number of rescue men fell by 77 owing to the closure of one pit and the amalgamation of two others.

The number of rescue stations will not be reduced to six until 1 January 1967.

(b) Re B: Number of operations

Operations carried out for "various reasons" were what may be called surveys made in 1965 under difficult environmental conditions in a mine situated in the Campine coalfield.

(c) Re C: Accidents to rescuers due to the wearing of gas masks

During practice with a breathing apparatus of the "Aerolux" type, the oxygen reserve was used up before the practice ended. The latter consisted of preliminary psychological tests and lasted altogether 120 mins. It seems that the apparatus had been filled too soon with liquid oxygen.

To avoid a repetition of such accidents, the officials in charge have been instructed to fill this type of apparatus immediately prior to use. The fact that the amount of reserve liquid oxygen cannot be checked is obviously a serious drawback.

(d) Research and development work on national and international levels was continued during the period under review. Particular interest attaches to:

(i) joint work on improving the physiological conditions for wearers of breathing apparatus (cf. D. I.1 d);

(ii) trials connected with flame propagation at the surface of a powdered urethane seal applied to roadway walls in order to extend the use of foamed urethane in underground workings;

(iii) regular, prolonged trials with a large number of rescue men in an experimental roadway of the Hasselt Co-ordination Centre for the purpose of defining, on the basis of results obtained criteria for the selection of rescue men in charge of rescue operations in unfavourable environmental conditions.

2. Glain Rescue Station (Liège coalfield)

(a) Re B: Number of operations

The operations referred to in column 6 were carried out in the pump room for the purpose of evacuating CH_4. The four operations referred to in column 18 relate to the sealing of a stopping by spraying plaster with a plaster lance designed by the rescue station, and with a cement injector.

(b) Re C: Accidents to rescuers due to the wearing of gas masks

Regarding the four non-fatal accidents referred to in column 4, it will be noted that:

1. During the period in question, the rescue men took part in 202 4-hour practice operations using a closed-circuit apparatus fitted with lime charges regenerated by a special distributor at the rescue station.

   In two cases, the operations had to be discontinued after 3 1/2 and 3 3/4 hours respectively owing to the charges becoming clogged. After they were

opened, it was found that during regeneration one screen had been given a double charge of lime and another vibrating screen had been omitted. When the charge and seal were subsequently checked they were found to be in order.

Although these defects only represent 1% of the charges used for 4 hours, they emphasise the importance of filling the charges correctly. No similar defect was found during 2,753 one- or two-hour practice operations in 1965 and 1966.

2. The inhaling valve of a closed-circuit Dräger apparatus of the 172 types did not function properly (mica splintering) during a practice operation. The operation was then discontinued owing to accumulation of CO_2.

   This incident shows how important it is to check valve operation, both when the apparatus and equipment is being prepared for use and, above all during use, with the same frequency as during rest periods (external condition, tightness, connections, etc.).

3. Although Messrs. Dräger have improved the thoric joint connecting the 2-litre flask to the pressure-reducing valve of the closed-circuit apparatus type 172, the joint is still unreliable and the same unexpected leakages occur.

   The rescue station's view is that this is mainly due to the flask being badly situated with respect to the pressure-reducing valve. The locking valve should be placed in exactly the same axis as that of the pressure-reducing valve.

   A standby thoric joint is attached to each 172-type apparatus, near the connection, so that any such mishap can be speedily remedied.

(c) Results of research and development work

(i) Plaster lance

The rescue station has developed a plaster lance which can be dismantled. This device was successfully employed during trials at our Station and for the sealing work referred to above.

(ii) Latex sealing

After many studies, the station was successful in developing a latex formula known as "latex F 32" which can be manufactured safely and rapidly at a reasonable cost price and only needs one vessel and one spray gun.

The surface spraying trials gave good results and continue to be satisfactory as regards adhesion and tightness.

ANNEX VI

COMPOSITION AND MEETINGS OF THE MINES SAFETY AND HEALTH COMMISSION AND ITS WORKING PARTIES (AS AT 31.12.67)

A.- MINES SAFETY AND HEALTH COMMISSION

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Employers' Representative

Dr.-Ing. F. BENTHAUS, Bergassessor a.D., Steinkohlenbergbauverein, 43 Essen, Frillendorferstr. 351

Workers' Representative

E. STEBEL, Leiter des Sachgebietes Arbeitsschutz, IG-Bergbau und Energie, 4630 Bochum, Alte Hattingerstr. 19

Technical Advisers

Oberbergamtsdirektor K. PALM, Ministerium für Wirtschaft, Mittelstand und Verkehr des Landes Nordrhein-Westfalen, 4 Düsseldorf, Haroldstr. 4

Oberbergamtsdirektor K. HÜBNER, Leiter der Unterabteilung Montanwirtschaft, Ministerium für Wirtschaft, Verkehr und Landwirtschaft, 66 Saarbrücken, Hardenbergstr. 8

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A. VANDENHEUVEL, Directeur Generaal van het Mijnwezen, Ministerie van economische Zaken en Energie, 24-26, rue J.A. Demot, Bruxelles 4

G. LOGELAIN, Inspecteur général des mines, Ministère des affaires économiques, 24-26, rue J.A. Demot, Bruxelles 4

Employers' Representative

A. HAUSMAN, Directeur du Centre de coordination de sauvetage du bassin de Campine, 555, Kempische Steenweg, Kiewit-Hasselt

Workers' Representative

L. THOMAS, Secrétaire national de la Centrale syndicale des travailleurs des usines de Belgique, 16, impasse Pirnay, Grace-Berleur

Technical Advisers

L. BOULET, Directeur général du Fonds national de retraite des ouvriers mineurs, Ministère du travail et de la prévoyance sociale, 6, place Stéphanie, Bruxelles

M. THOMASSEN, Président national de la Centrale des francs-mineurs, 145, rue Belliard, Bruxelles

FRANCE

Government Representatives

A. REBIERE, Ingénieur en chef, chef du service de l'hygiène et de la sécurité dans les mines, Direction des mines, Ministère de l'industrie, 97, rue de Grenelle, 75-Paris 7e

L. KOCH, Ingénieur en chef des mines, Direction des mines, Ministère de l'industrie, 97, rue de Grenelle, 75-Paris 7e

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A. PROUST, Directeur général des services techniques des charbonnages de France, 9, avenue Percier, 75-Paris 8e

Workers' Representative

L. CHAUVEAU, Fédération nationale des syndicats chrétiens des mineurs, 8, rue de Navarre, Paris 5e

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ITALY

Government Representatives

Dott. Consigliere B. COLUCCI, Direzione generale dell'emigrazione, Ministero degli affari esteri, Roma

Dott. Ing. M. MARRA, Ispettore generale delle miniere, Ministero dell'industria e commercio, via Veneto 33, Roma

Employers' Representative

Prof. M. CARTA, Istituto Arte Mineraria della facoltà d'Ingegneria, Piazza d'Armi, Cagliari (Sardegna)

Workers' Representative

Dott. G. CRAVIOTTO, Segretario generale della Federestrattive, via Isonzo 42, Roma

Technical Advisers

Dott. C. MICHELAZZI, Ispettore generale del Ministero del lavoro e della previdenza sociale, via Flavia 6, Roma

Dott. R. PURPURA, Direttore generale al Ministero del lavoro, via Flavia 6, Roma

LUXEMBOURG

Government Representatives

A. SCHUSTER, Ingénieur-directeur du travail et des mines, inspection du travail et des mines, 19, av. Gaston Diderich, Luxembourg

Employers' Representative

A. RAUS, Directeur à l'A.R.B.E.D., Luxembourg

Workers' Representative

N. PASCOLINI, Président de la délégation ouvrière d'Arbed-Mines, 90, rue des Fleurs, Schifflange

NETHERLANDS

Government Representatives

Ir. A.H.W. MARTENS, Inspecteur-generaal der Mijnen, Staatstoezicht op de Mijnen, Apollolaan 9, Heerlen (L.)

Drs. D.C. VAN DER HOOFT, Hoofd van de Directie Mijnwezen, Ministerie van Economische Zaken, Bezuidenhoutseweg 30, 's-Gravenhage

Employers' Representative

Ir. G.B. DEBETS, Directeur, Oranje-Nassau Mijnen, Heerlen (L.)

Workers' Representative

J.M. WEIJERS, Vice-Voorzitter van de Nederlandse Katholieke Mijnwerkersbond, Seringenstraat 9 ter, Passart-Zuid

Technical Adviser

H.L. GROND, Katholieke Vereniging van Mijnbeambten, Schelsberg 202, Heerlerheide (L.)

UNITED KINGDOM

Government Representative

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Employers' Representative

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Workers' Representative

S. BULLOUGH, Vice-President of the National Union of Mineworkers, c/o Miners' Offices, Barnsley / Yorkshire

INTERNATIONAL LABOUR ORGANISATION, GENEVA

A representative of the International Labour Office sitting as an observer.

B.- RESTRICTED COMMITTEE

The Restricted Committee consists of the Government members of the Mines Safety and Health Commission.

C.- WORKING PARTIES ON TECHNICAL QUESTIONS

I. Working Party on Electrification

- Members of the Working Party

GERMANY

Oberbergamtsdirektor G. EPPING, Oberbergamt, 46 Dortmund, Goebenstr. 25-27

BELGIUM

G. LOGELAIN (1), Inspecteur général des mines, Ministère des affaires économiques, 24-26, rue J.A. Demot, Bruxelles 4

R. STENUIT, Directeur divisionnaire à l'Administration des mines, 24-26, rue J.A. Demot, Bruxelles 4

G.J.A. COOLS, Divisiedirecteur van het Mijnwezen, 24-26, rue J.A. Demot, Bruxelles 4

FRANCE

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P. FLINOIS, Houillères du bassin du Nord et du Pas-de-Calais, service technique du fond, 20, rue des Minimes, Douai/Nord

---

(1) Chairman of the Working Party as representative of the Restricted Committee

ITALY

Dott. Ing. C. MACCIONI, ENEL, Vice-Direttore della Miniera di Seruci, Casella postale 117, Carbonia (Cagliari)

LUXEMBOURG

E. MULLER, Ingénieur des mines à la division des mines de l'ARBED, Esch-sur-Alzette

NETHERLANDS

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P.H. GIESBERTZ, p/a Staatsmijn Emma/Hendrik te Hoensbroek, Hoensbroek/Heerlen

UNITED KINGDOM

D.E. FOX, H.M. Principal Electrical Inspector of Mines and Quarries, Thames House, Millbank, London S.W. 1

- Experts on cables and leads

H. GOBBE, Directeur à la division câblerie des A.C.E.C., Charleroi

M. OSTY, Directeur technique à la société industrielle de liaisons électriques, 64bis, rue de Monceau, Paris 8e

F. VIN, Ingénieur au CERCHAR, Verneuil-en-Halatte (Oise)

Y. EYRAUD, Chef du laboratoire d'études générales des câbles de Lyon, 170, avenue Jean-Jaurès, Lyon (Rhône)

Ir. F. GOEDBLOED, Nederlandse Kabelfabriek, Delft

Ir. W.L. BAER, N.V. Hollandse Draad- en Kabelfabriek, Amsterdam

II. Working Party on Rescue Arrangements and on Fires and Underground Combustion

- Members of the Working Party

GERMANY

Ministerialdirigent Dr.-Ing. K. HELLER (1), Ministerium für Wirtschaft, Mittelstand und Verkehr, Land Nordrhein-Westfalen, 4 Düsseldorf, Haroldstr. 4

Dipl. Berging. E. BREDENBRUCH, Leiter der Hauptstelle für das Grubenrettungswesen des Steinkohlenbergbauvereins, 43 Essen-Kray, Schönscheidtstr. 28

Dipl. Ing. A. SCHEWE, Technischer Leiter der Hauptstelle für das Grubenrettungswesen des Steinkohlenbergbauvereins, 43 Essen-Kray, Schönscheidtstr. 28

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Ir. L.P.A. VAN POL, Chef van de Veiligheidsdienst, p/a ORANJE-NASSAU MIJNEN, Heerlen (L.)

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Prof. Dr. W. MAAS, Prof. van de Veiligheidsdienst, N.V. Nederlandse Staatsmijnen, Postbus 65, Heerlen (L.)

UNITED KINGDOM

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2. Experts on Fire-Resistant Fluids

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Prof. Dr. med. C.A. PRIMAVESI, Hygiene-Institut des Ruhrgebietes, 4650 Gelsenkirchen, Rotthauserstr. 19

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FRANCE

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G. BLANPAIN, Ingénieur au centre d'études et recherches des charbonnages de France, Verneuil-en-Halatte (Oise)

Dr J.J. JARRY, Médecin-chef des charbonnages de France, 9, avenue Percier, Paris 8e

Dr C. CLAEYS, houillères du bassin du Nord et du Pas-de-Calais, centre d'études médicales minières, 129-133, avenue Salengro, Sin-le-Noble

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III. Working Party on Winding Ropes and Shaft Guides

- Members of the Working Party

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