

Lovett's IGA Foodliner, foodstore; Carmack Boulevard, Columbia, TN; stock clerk, bagger; 12 to 15 percent; 2-3-72.

McDonald's Hamburgers, restaurants, for the occupation of general restaurant worker, 31 to 58 percent, 2-14-72, except as otherwise indicated; 290 East 69 Highway, Claycomo, MO; 4002 North Oak Street, Kansas City, MO (27 to 61 percent, 2-17-72); 3115 Raytown Road, Kansas City, MO; 8020 South 71 Highway, Kansas City, MO (1-28-72); 9066 East 50 Highway, Raytown, MO (27 to 61 percent).

Milaca Area Hospital, hospital; 150 10th Street NW., Milaca, MN; nurse's aide, dietary aide, housekeeping aide, laundry aide, office clerk; 3 to 5 percent; 1-31-72.

Milo's AG Market, foodstore; 204 South State Street, Preston, ID; bakery clerk, meat wrapper, stock clerk, carryout; 21 to 25 percent; 1-31-72.

Mr. Smorgasbord, Inc., restaurants, for the occupations of food preparer, busboy (girl), cashier, dishwasher, cleanup, 54 to 82 percent, 1-31-72, except as otherwise indicated; 6933 Indianapolis Boulevard, Hammond, IN; 136 East McKinley, Mishawaka, IN; 2800 Niles Avenue, St. Joseph, MI (2-1-72).

Newman's, apparel store; 4027 Franklin Street, Michigan City, IN; office clerk, stock clerk, marking clerk, fitting room checker; 8 to 9 percent; 2-2-72.

Pak-A-Sak Food Stores Inc., foodstore; Highway 24, Swansboro, NC; bagger, carryout; 9 to 10 percent; 1-31-72.

Pence-Ottawa North, Inc., foodstore; 305 North Main, Ottawa, KS; stock clerk, carryout, janitorial, bagger, cashier; 8 to 25 percent; 1-29-72.

Piggly Wiggly, foodstores, for the occupation of bagger, 1-31-72, except as otherwise indicated; 410 North Main Street, Arab, AL, 9 to 15 percent; Wright Shopping Center, Fort Walton Beach, Fla., 9 to 10 percent (1-21-72); 1165 27th Street, Columbus, GA, 10 to 13 percent (janitorial, bagger, bottle clerk).

Prince, Inc., foodstores, for the occupation of bagger; Brooks-Plaza Shopping Center, Fort Walton Beach, Fla., 10 percent, 1-20-72; Towncrest Shopping Center, Fort Walton Beach, Fla., 9 to 10 percent, 2-5-72.

Professional Services, restaurants, for the occupation of general restaurant worker, 4 to 22 percent, 2-8-72: Nos. 652 and 653, San Antonio, Tex.

Ream's Bargain Annex, Inc., foodstores, for the occupations of stock clerk, cleanup, bagger, 26 to 33 percent, 1-31-72; No. 5, Bountiful, Utah; No. 6, Salt Lake City, Utah; 4750 South Redwood Road, Taylorsville, UT.

Red & White Super Market, foodstore; 1503 Highland Avenue, Montgomery, AL; bagger, stock clerk; 10 to 21 percent; 2-17-72.

Rhea's, Inc., foodstore; Allegheny Center Mall, Pittsburgh, Pa.; salesclerk; 18 to 27 percent; 2-19-72.

Rushing & Swope Maverick Steak House, Inc., restaurant; Pasadena, Tex.; dishwasher, busboy (girl), cook, cleanup, janitorial, serving line helper; 20 to 21 percent; 2-16-72.

Saxons Sandwich Shoppe, restaurant; 2610 East Belt Line SE., Grand Rapids, MI; busboy (girl), coffee girl (boy), counterworker, dishwasher, food preparer, short order cook; 49 to 77 percent; 1-31-72.

Schensul's Cafeteria, Inc., restaurant; 3635 28th Street, Grand Rapids, MI; busboy (girl), coffee girl (boy), counter worker, dishwasher, food preparer, short order cook; 49 to 77 percent; 1-31-72.

Style Shop Inc., apparel store; 420 South Main Street, Elkhart, IN; office clerk, stock clerk, marking clerk, fitting room checker; 8 to 9 percent; 2-2-72.

Thornton & Thornton, foodstore; Odem, Tex.; carryout, stock clerk, janitorial; 12 to 25 percent; 2-8-72.

Top Save Department Store, Inc., variety-department store; Westgate Plaza, Streator, Ill.; salesclerk; 10 to 33 percent; 1-21-72.

Tower Super Markets, Inc., foodstore; Million Dollar Highway, Weedville, Pa.; checker, carryout, stock clerk, clerk, meat and produce wrapper; 17 to 37 percent; 1-26-72.

Vista at Emporia, Inc., restaurant; 825 West Sixth Street, Emporia, KS; cashier, fountain clerk, cook, dishwasher, general restaurant worker; 4 to 34 percent; 2-1-72.

Wabasha Super Valu, foodstore; Wabasha, Minn.; carryout, cleanup, checker, stock clerk; 14 to 21 percent; 1-21-72.

Walgren's Market, Inc., foodstore; West Main Street, New London, Iowa; carryout, stock clerk, checker, meat clerk; 13 percent; 2-12-71 to 1-29-72.

Whetstone Valley Nursing Home, nursing home; 1103 South Second Street, Milbank, SD; waiter-waitress, kitchen helper, tray carrier, yard worker; 4 to 18 percent; 2-12-71 to 12-30-71.

Wilke's Sure Save, foodstore; 124 Main Street, Fredericksburg, Iowa; checker, stock clerk, carryout; 17 to 26 percent; 1-31-72.

Willard's IGA, foodstore; Sixth and Pacific, Osawatomie, KS; stock clerk, sacker, carryout; 4 to 14 percent; 2-12-71 to 1-31-72.

Wood's 5 & 10¢ Store, variety-department store; West Hudson Street, Fayetteville, NC; salesclerk, stock clerk; 9 to 20 percent; 2-2-72.

Zumbrota Super Valu, foodstore; Zumbrota, Minn.; carryout, cleanup, checker, stock clerk; 14 to 21 percent; 1-21-72.

Each certificate has been issued upon the representations of the employer which, among other things, were that employment of full-time students at special minimum rates is necessary to prevent curtailment of opportunities for employment, and the hiring of full-time students at special minimum rates will not create a substantial probability of reducing the full-time employment opportunities of persons other than those employed under a certificate. The certificates may be annulled or withdrawn, as indicated therein, in the manner provided in Part 528 of Title 29 of the Code of Federal Regulations. Any person aggrieved by the issuance of any of these certificates may seek a review or consideration thereof within 30 days after publication of this notice in the FEDERAL REGISTER pursuant to the provisions of 29 CFR 519.9.

Signed at Washington, D.C. this 14th day of May 1971.

ROBERT G. GRONEWALD,
Authorized Representative
of the Administrator.

[FR Doc.71-7169 Filed 5-21-71;8:48 am]

INTERSTATE COMMERCE COMMISSION FOURTH SECTION APPLICATIONS FOR RELIEF

MAY 19, 1971.

Protests to the granting of an application must be prepared in accordance with Rule 1100.40 of the general rules of practice (49 CFR 1100.40) and filed within 15 days from the date of publication of this notice in the FEDERAL REGISTER.

LONG-AND-SHORT HAUL

FSA No. 42204—Ethylene Glycol to Atlanta, Ga. Filed by O. W. South, Jr., agent (No. A6255), for interested rail carriers. Rates on ethylene glycol, in tank carloads, as described in the application, from Wilmington, N.C., to Atlanta, Ga.

Grounds for relief—Market competition.

Tariff—Supplement 57 to Southern Freight Association, agent, tariff ICC S-832.

FSA No. 42205—Chlorine to Canton, N.C. Filed by O. W. South, Jr., agent (No. A6256), for interested rail carriers. Rates on chlorine, in tank carloads, as described in the application, from specified points in West Virginia, to Canton, N.C.

Grounds for relief—Market competition.

Tariff—Supplement 125 to Traffic Executive Association-Eastern Railroads, Agent, tariff ICC C-611.

By the Commission.

[SEAL] ROBERT L. OSWALD,
Secretary.

[FR Doc.71-7187 Filed 5-21-71;8:49 am]

[Notice 693]

MOTOR CARRIER TRANSFER PROCEEDINGS

MAY 19, 1971.

Synopses of orders entered pursuant to section 212(b) of the Interstate Commerce Act, and rules and regulations prescribed thereunder (49 CFR Part 1132), appear below:

As provided in the Commission's special rules of practice any interested person may file a petition seeking reconsideration of the following numbered proceedings within 20 days from the date of publication of this notice. Pursuant to section 17(8) of the Interstate Commerce Act, the filing of such a petition will postpone the effective date of the order in that proceeding pending its disposition. The matters relied upon by petitioners must be specified in their petitions with particularity.

No. MC-FC-72805. By order of May 14, 1971, the Motor Carrier Board approved the transfer to Carolina Transit Lines of Charlotte, Inc., Charlotte, N.C., of the operating rights in Certificate No. MC-124473 (Sub-No. 1), issued April 16, 1964, to Clyde N. Herron and Robert P. Gaddy, a partnership, doing business as Carolina Transit Lines, Charlotte, N.C., authorizing the transportation of passengers and their baggage, in charter operations, during the season extending from June 1 to August 31, inclusive, of each year, between Charlotte, N.C., and the site of the Y.M.C.A. Fresh Air Camp situated on the Catawba River in York County, S.C., near the Buster Boyd Bridge. Dotson G. Palmer, 1215 American Building, Charlotte, NC 28202, attorney for applicants.

No. C-72809. By order of May 13, 1971, the Motor Carrier Board approved the transfer to Sharkey Transportation, Inc.,

Burlington, Iowa, of the operating rights in Certificate No. MC-123294 (Sub-No. 14), issued July 18, 1967 to Warsaw Trucking Co., Inc., Warsaw, Ind., authorizing the transportation of such commodities as are sold by retail mail order houses from Quincy, Ill., to points in Illinois, Missouri, Iowa, and Wisconsin. Martin J. Leavitt, 1800 Buhl Building, Detroit, MI 48226, Attorney for applicants.

No. MC-FC-72819. By order of May 14, 1971, the Motor Carrier Board approved the transfer to O'Neill Transfer Company, Inc., Portland, Oreg., of the operating rights in Certificate No. MC-78277 issued February 10, 1965, to McCabe Moving & Storage Co., a corporation, Portland, Oreg., authorizing the transportation of general commodities, with usual exceptions, between points within three miles of Portland, Oreg., including Portland; agricultural commodities and livestock, from points in Wasco, Sherman, Gilliam, Morrow, and Jefferson Counties, Oreg., to points served by railroads and to steamship docks in said counties, and livestock between points in Wasco County, Oreg., on the one hand, and, on the other, points in Clark, Skamania, Benton, Walla Walla, Franklin, and Adams Counties, Wash. Earle V. White, 2400 Southwest Fourth Avenue, Portland, OG 97201, attorney for applicants.

No. MC-FC-72820. By order of May 14, 1971, the Motor Carrier Board approved the transfer to P & C Trucking, Inc., Pinckneyville, Ill., of the operating rights in Certificate No. MC-125534 (Sub-No. 1), issued May 4, 1971, to Felix Frassato, Inc., Internal Revenue Service, successor in interest, Mt. Vernon, Ill., authorizing the transportation of lumber from specified counties in Indiana and Illinois to

specified points and areas in Indiana, Wisconsin, Iowa and Missouri. Delmar O. Koebel, 107 West St. Louis Street, Lebanon, IL 62254, attorney for transferee.

No. MC-FC-72828. By order of May 10, 1971, the Motor Carrier Board approved the transfer to Stanley V. Majkut, doing business as Mobile Air Transport, Latham, Ill., of Certificate No. MC-125758, issued August 11, 1964, to Stanley Va. Majkut and Francis P. Rogers, a partnership, doing business as Mobile Air Transport, Schenectady, N.Y., authorizing the transportation of: General commodities, having a prior or subsequent movement by air (except those of unusual value, classes A and B explosives, household goods as defined by the Commission, commodities in bulk, and those requiring special equipment), over a regular route, from and to the Albany County Airport, N.Y., serving all intermediate points, and the off-route points of Hoosick Falls, N.Y., and North Bennington, Vt., over a specified circuitous routing. W. Norman Charles, 80 Bay Street, Glenn Falls, NY 12801, attorney for applicants.

No. MC-FC-72850. By order of May 14, 1971, the Motor Carrier Board approved the transfer to Selective Transportation Corporation, West New York, N.J., of the operating rights in Certificate No. MC-1305 issued April 29, 1964, to Selective Transportation Corp., West New York, N.J., authorizing the transportation of: General commodities, usual exceptions, between points in New York, Connecticut, and New Jersey within 50 miles of Columbus Circle, New York, N.Y. William Biederman, 280 Broadway, New York, NY 10007, attorney.

No. MC-FC-72853. By order of May 14, 1971, the Motor Carrier Board approved

the transfer to West Coast Moving & Storage, Inc., Long Beach, Calif. of Certificates Nos. MC-24435 and MC-24435 (Sub-No. 2), issued April 19, 1966 and November 7, 1969, respectively, to City Van & Storage, Santa Fe Springs, Calif. authorizing the transportation of household goods as defined by the Commission and used household goods between specified points in California. R. Y. Schureman, 1545 Wilshire Boulevard, Los Angeles, CA 90017, attorney for applicants.

No. MC-FC-72854. By order of May 14, 1971, the Motor Carrier Board approved the transfer to Shapiro-Lampert Express Co., Inc., Commack, N.Y., of Permits Nos. MC-127480 (Sub-No. 1), and MC-127480 (Sub-No. 3), issued to Lampert Trucking, Inc., Commack, N.Y., authorizing the transportation of: Wearing apparel and piece goods, between specified points in New York. Arthur J. Piken, 1 Lefrak City Plaza, Flushing, NY 11368, attorney.

No. MC-FC-72857. By order of May 14, 1971, the Motor Carrier Board approved the transfer to Dorothy L. Norton and Bradford Norton, a partnership, doing business as Norton's Bus and Taxi Co., Tyler Hill, Pa., of Certificate No. MC-79929, issued September 19, 1955, to William B. Coe and Grace E. Coe, a partnership, doing business as Coe's Taxi Service, Damascus, Pa., authorizing the transportation of passengers and their baggage, between Cohecton, N.Y., and Honesdale, Camp With-A-Wind, and Camp Swago, Pa. Kenneth R. Davis, 999 Union Street, Taylor, PA 18517, applicants' practitioner.

[SEAL]

ROBERT L. OSWALD,
Secretary.

[FR Doc.71-7188 Filed 5-21-71; 8:49 am]

CUMULATIVE LIST OF PARTS AFFECTED—MAY

The following numerical guide is a list of parts of each title of the Code of Federal Regulations affected by documents published to date during May.

3 CFR	Page	8 CFR	Page	14 CFR—Continued	Page
PROCLAMATIONS:				PROPOSED RULES—Continued	
4049	8289	103	9001	25	8383
4050	8551	204	8294	27	8383
4051	8553	214	8660	29	8383
4052	8657	234	8294	33	8383
4053	8859	238	8294	39	8695, 8696, 9026
4054	9199	248	9001	71	8263,
		299	8295, 8505, 9002		8316-8319, 8405, 8524, 8525, 8591,
		499	8505		8696, 8697, 8880, 8963, 9026, 9027,
EXECUTIVE ORDERS:					9075, 9076, 9143
2295 (revoked by PLO 5052)	8807	PROPOSED RULES:		73	9076
10480 (see EO 11594)	8995	211	9251	75	8264, 8406, 9076, 9258
11592	8555	242	9251	93	9029
11593	8921			121	8813
11594	8995	9 CFR		139	8880
PRESIDENTIAL DOCUMENTS OTHER		76	8362, 8363,	239	8739
THAN PROCLAMATIONS AND EX-			8507, 8659, 8660, 8861, 8930, 8931,	241	9030
ECUTIVE ORDERS:			9240	288	9330
Memorandum of April 30,		97	8238, 8861		
1971	8721	331	9002-9004		
		PROPOSED RULES:			
5 CFR		145	9104	15 CFR	
213	8235, 8501, 8723, 9235	147	9104	370	8367
307	8773			371	8367, 8932
771	9235	10 CFR		372	8368
		50	8861	373	8369
7 CFR		PROPOSED RULES:		374	8370, 8776, 8932
19	8433	2	8379	376	8370, 8932
51	8502, 9061, 9125	140	8454	379	8371, 8776
52	8557			399	8776
319	9061	12 CFR			
354	8235	1	8723, 9065	16 CFR	
724	8291, 8503	201	8441	1	9293
751	8505	222	9292	2	9008
811	8773	545	8507, 8724	3	9008
845	9061	703	8508	4	9009
905	9129	PROPOSED RULES:		13	8292, 8665
907	8291	545	9333	424	8777
908	8361, 8441, 8774, 9129, 9289	555	9077	PROPOSED RULES:	
909	8671, 8997	747	8591	240	9260
910	8236, 8291, 8558, 8925, 9061, 9289			17 CFR	
911	8236	13 CFR		201	8933
916	9289	121	8660	230	8935
917	8671	PROPOSED RULES:		231	8238
918	8876	121	9144	240	8935
923	9314			241	8238
928	8925	14 CFR		249	8239
944	9236	39	8209,	270	8729
966	9290		8306, 8307, 8509, 8862, 9005-9007,	271	8729, 9130
980	9291		9241	PROPOSED RULES:	
1015	8361	47	8661	240	9260
1421	8291, 8362, 8559, 8930, 8997, 9001, 9236	49	8661	249	9261
1430	8237	71	8209,	270	8319, 9134
PROPOSED RULES:			8210, 8307, 8308, 8363-8365, 8509,	274	8319, 8525, 9134, 9261
55	9307		8510, 8662, 8775, 8863, 8864, 9065-9067, 9130		
717	9251	73	8210, 8510, 9067	18 CFR	
730	8261	75	8210, 8308	Ch. I	9242
814	9071	95	8308	101	8240
911	8520, 9071	97	9293	104	8240
915	8522	105	8775	141	8240
917	8735	249	8724	201	8240
919	9252	287	8311	204	8240
929	8453	302	8560	260	8240
953	8956, 9252	310	8562	601	8666
966	8262, 8677	378	8725	615	8563
980	8262, 8677	378a	8728	PROPOSED RULES:	
1030	9025	PROPOSED RULES:		640	8739
1036	8524, 8880, 8957	1	8383	19 CFR	
1125	8678	21	8383	1	8666
1136	8376	23	8383, 8398	12	8667
1207	8588				

19 CFR—Continued

16	8365
153	9009, 9010
174	8731
PROPOSED RULES:	
10	8312
22	9071

20 CFR

1	8936
2	8936
404	8366
PROPOSED RULES:	
405	8960
602	8524

21 CFR

3	8939
25	9010
132	8242
135c	8732
135e	8781
135g	8781
141a	9244
146a	9244
148b	8242
149y	8243
420	8243, 8441
PROPOSED RULES:	
Ch. I	8738
121	9025
420	8455

22 CFR

51	9068
----	------

23 CFR

1	8243
---	------

24 CFR

1	8784
7	8942
41	8785
42	8785
213	8211
220	8211
221	8211
231	8212
232	8212
234	8212
235	8212
242	8212
810	8212
1000	8212
1100	8212
Ch. III	8213
1914	8233, 8565, 8877, 9246
1915	8234, 8366, 8566, 8878, 8942, 9247
PROPOSED RULES:	
1913	8453
1930	9315
1931	9316
1932	9318
1933	9319
1934	9325

25 CFR

41	8366
PROPOSED RULES:	
161	8520
221	8677

26 CFR

1	9010, 9018
13	9010
31	9020, 9201
170	8668
201	8568
245	8798, 9294
252	8568
301	9020
PROPOSED RULES:	
1	8585, 8808, 9024, 9138, 9142, 9298
13	9298

29 CFR

5	8949
101	9132
102	9132
615	9294
697	9134
1518	8311
1601	9068
1950	8864
PROPOSED RULES:	
727	8960
1903	8376, 8591, 8813
1904	8693

30 CFR

77	9364
PROPOSED RULES:	
75	8453

31 CFR

10	8671
500	8584

32 CFR

190	9294
591	8943
592	8947
593	8947
594	8947
597	8948
598	8948
599	8948
600	8948
602	8948
606	8948
812	8258
1001	8258
1007	8259
1030	8259

32A CFR

Ch. VII:	
T-2 (amended)	8672
Ch. VIII	9136, 9297
PROPOSED RULES:	
Ch. VI	9072, 9073
Ch. X	8587

33 CFR

1	8732
3	8211
40	9135
62	9021
74	9021
207	8866
PROPOSED RULES:	
110	8962
117	8382, 9328

35 CFR

253	9021
-----	------

36 CFR

7	9248
326	8442
PROPOSED RULES:	
7	8585, 9251
50	8813

37 CFR

1	8732
202	8868

38 CFR

2	9248
3	8445
13	9249
17	9249
21	9021

39 CFR

3	8673
5	8673
124	8372

PROPOSED RULES:

Ch. I	8879
-------	------

41 CFR

5A-1	8953
5A-16	8953
5A-73	8374
5B-12	8510
8-16	8953
14-1	9295
14-51	9295
15-1	8447
101-20	8295
101-26	8295
101-38	8869
101-45	8567
101-47	9021
115-1	8568

PROPOSED RULES:

3-1	8814
3-16	9253

42 CFR

37	8869
----	------

PROPOSED RULES:

72	8815
----	------

43 CFR**PUBLIC LAND ORDERS:**

2721 (revoked in part by PLO 5050)	8450
5024 (corrected by PLO 5051)	8450
5029 (corrected by PLO 5049)	8450
5032 (corrected by PLO 5057)	8950
5049	8450
5050	8450
5051	8450
5052	8807
5053	8949
5054	8949
5055	8949
5056	8950
5057	8950
5058	9022
5059	9135
5060	9136
5061	9136
PROPOSED RULES:	
1810	8956

45 CFR	Page	47 CFR—Continued	Page	49 CFR—Continued	Page
119.....	8950	73.....	8451	1124.....	8211
140.....	8952	74.....	8871	1202.....	9070
142.....	9249	89.....	9250	1208.....	9070
PROPOSED RULES:		PROPOSED RULES:		PROPOSED RULES:	
116.....	8316	1.....	8382	173.....	8329
132.....	8316	2.....	8591	179.....	8329
903.....	8816	15.....	8963	Ch. X.....	8599, 8889
906.....	8525	73.....	8382,	1115.....	8740
1201.....	8698	8455, 8456, 8591, 8699, 9259, 9333		1123.....	8327
		74.....	8382, 8457, 8591		
46 CFR	Page	49 CFR		50 CFR	
309.....	8511	1.....	8733	17.....	8675
542.....	8259	7.....	8873	28.....	8734
PROPOSED RULES:		25.....	9178	32.....	8942
251.....	9333	173.....	9068	33.....	8807
252.....	9334	177.....	9068	250.....	8874
278.....	9336	195.....	8296	266.....	8675
503.....	8460	230.....	9069	277.....	8675
510.....	8460	391.....	8452	280.....	8515
543.....	8460, 9260	392.....	8452	PROPOSED RULES:	
47 CFR		571.....	8296, 8298, 8734, 9069	10.....	8677
0.....	8450, 8733, 8871	1033.....	8306, 8673, 8674, 8952	80.....	8261
31.....	8374	1047.....	9022	258.....	9074
33.....	8374	1104.....	9022	260.....	8688
64.....	8450, 8733				

LIST OF FEDERAL REGISTER PAGES AND DATES—MAY

Pages	Date
8203-8281.....	May 1
8283-8354.....	4
8355-8426.....	5
8427-8494.....	6
8495-8543.....	7
8545-8649.....	8
8651-8716.....	11
8717-8765.....	12
8767-8851.....	13
8853-8914.....	14
8915-8988.....	15
8989-9054.....	18
9055-9119.....	19
9121-9191.....	20
9193-9281.....	21
9283-9385.....	22

federal register

SATURDAY, MAY 22, 1971

WASHINGTON, D.C.

Volume 36 ■ Number 100

PART II



DEPARTMENT OF THE INTERIOR

■

Bureau of Mines

■

**Mandatory Safety Standards, Surface
Coal Mines and Surface Work Areas
of Underground Coal Mines**

Title 30—MINERAL RESOURCES

Chapter I—Bureau of Mines, Department of the Interior

SUBCHAPTER O—COAL MINE HEALTH AND SAFETY

PART 77—MANDATORY SAFETY STANDARDS, SURFACE COAL MINES AND SURFACE WORK AREAS OF UNDERGROUND COAL MINES

Pursuant to the authority vested in the Secretary of the Interior under paragraph (1) of section 101, and in accordance with the provisions of section 101 of the Federal Coal Mine Health and Safety Act of 1969 (83 Stat. 742; 30 U.S.C. 801; Public Law 91-173), there was published in the FEDERAL REGISTER for December 19, 1970 (35 F.R. 19298), a notice of proposed rulemaking setting forth proposed mandatory safety standards which shall apply to all bituminous, anthracite, and lignite surface coal mines, including open pit and auger mines, and to the surface work areas of underground coal mines.

Interested persons were afforded a period of 45 days from the date of publication of the notice in which to submit written comments, suggestions or objections to the proposed Part 77. Approximately 26 associations, companies, and individuals submitted comments, suggestions, or objections. All were given careful and thorough consideration. A summary of the comments and an explanation of the actions taken with respect to them will be prepared by the Bureau of Mines and will be available 30 days from the date of this publication in the Office of the Deputy Director for Health and Safety, Room 4512, Bureau of Mines, Department of the Interior, Washington, DC 20240.

Some standards have been revised as suggested and in other instances revisions were made in view of the comments received, or to conform and clarify other provisions in view of changes and revisions which were made. Some of the suggestions could not be adopted because they were contrary to statutory provisions.

Part 77—Mandatory Safety Standards, Surface Coal Mines and Surface Work Areas of Underground Coal Mines—of Title 30, Code of Federal Regulations, Subchapter O—Coal Mine Health and Safety, as set forth below is herewith promulgated and shall become effective on July 1, 1971.

ROGERS C. B. MORTON,
Secretary of the Interior.

MAY 17, 1971.

Subpart A—General

Sec.	Scope.
77.1	Definitions.
77.2	
Subpart B—Qualified and Certified Persons	
77.100	Certified person.
77.101	Tests for methane and for oxygen deficiency; qualified person.

Sec.	
77.102	Tests for methane; oxygen deficiency; qualified person, additional requirement.
77.103	Electrical work; qualified person.
77.104	Repair of energized surface high voltage lines; qualified person.
77.105	Qualified hoistman; slope or shaft sinking operation; qualifications.
77.106	Records of certified and qualified persons.
77.107	Training programs.
77.107-1	Plans for training programs.

Subpart C—Surface Installations

77.200	Surface installations; general.
77.201	Methane content in surface installations.
77.201-1	Tests for methane; qualified person; use of approved device.
77.201-2	Methane accumulations; change in ventilation.
77.202	Dust accumulations in surface installations.
77.203	Use of material or equipment overhead; safeguards.
77.204	Openings in surface installations; safeguards.
77.205	Travelways at surface installations.
77.206	Ladders; construction; installation and maintenance.
77.207	Illumination.
77.208	Storage of materials.
77.209	Surge and storage piles.
77.210	Hoisting of materials.
77.211	Draw-off tunnels; stockpiling and reclaiming operations; general.
77.211-1	Continuous methane monitoring device; installation and operation; automatic deenergization of electric equipment.
77.212	Draw-off tunnel ventilation fans; installation.
77.213	Draw-off tunnel escapeways.
77.214	Refuse piles; general.
77.215	Refuse piles, construction requirements.
77.216	Retaining dams; construction; inspection; records.

Subpart D—Thermal Dryers

77.300	Thermal dryers; general.
77.301	Dryer heating units; operation.
77.302	Bypass stacks.
77.303	Hot gas inlet chamber dropout doors.
77.304	Explosion release vents.
77.305	Access to drying chambers, hot gas inlet chambers and ductwork; installation and maintenance.
77.306	Fire protection.
77.307	Thermal dryers; location and installation; general.
77.308	Structures housing other facilities; use of partitions.
77.309	Visual check of system equipment.
77.309-1	Control stations; location.
77.310	Control panels.
77.311	Alarm devices.
77.312	Fall safe monitoring systems.
77.313	Wet-coal feedbins; low-level indicators.
77.314	Automatic temperature control instruments.
77.315	Thermal dryers; examination and inspection.

Subpart E—Safeguards for Mechanical Equipment

77.400	Mechanical equipment guards.
77.401	Stationary grinding machines; protective devices.
77.402	Hand-held power tools; safety devices.
77.403	Mobile equipment; canopies and roll protection.

Sec.	
77.404	Machinery and equipment; operation and maintenance.
77.405	Performing work from a raised position; safeguards.
77.406	Drive belts.
77.407	Power driven pulleys.
77.408	Welding operations.
77.409	Shovels, draglines, and tractors.
77.410	Mobile equipment; automatic warning devices.
77.411	Compressed air and boilers; general.
77.412	Compressed air systems.
77.413	Boilers.

Subpart F—Electrical Equipment—General

77.500	Electric power circuits and electric equipment deenergization.
77.501	Electric distribution circuits and equipment; repair.
77.501-1	Qualified person.
77.502	Electric equipment; examination, testing, and maintenance.
77.502-1	Qualified person.
77.502-2	Electric equipment; frequency of examination and testing.
77.503	Electric conductors; capacity and insulation.
77.503-1	Electric conductors.
77.504	Electrical connections or splices; suitability.
77.505	Cable fittings; suitability.
77.506	Electric equipment and circuits; overload and short-circuit protection.
77.506-1	Electric equipment and circuits; overload and short circuit protection; minimum requirements.
77.507	Electric equipment; switches.
77.508	Lightning arresters; ungrounded and exposed power conductors and telephone wires.
77.508-1	Lightning arresters; wires entering buildings.
77.509	Transformers; installation and guarding.
77.510	Resistors; location and guarding.
77.511	Danger signs at electrical installations.
77.512	Inspection and cover plates.
77.513	Insulating mats at power switches.
77.514	Switchboards; passageways and clearance.
77.515	Bare signal or control wires; voltage.
77.516	Electric wiring and equipment; installation and maintenance.

Subpart G—Trailing Cables

77.600	Trailing cables; short-circuit protection; disconnecting devices.
77.601	Trailing cables or portable cables; temporary splices.
77.602	Permanent splicing of trailing cables.
77.603	Clamping of trailing cables to equipment.
77.604	Protection of trailing cables.
77.605	Breaking trailing cable and power cable connections.
77.606	Energized trailing cables; handling.
77.606-1	Rubber gloves; minimum requirements.

Subpart H—Grounding

77.700	Grounding metallic sheaths, armors, and conduits enclosing power conductors.
77.700-1	Approved methods of grounding.
77.701	Grounding metallic frames, casings, and other enclosures of electric equipment.

Sec.	
77.701-1	Approved methods of grounding of equipment receiving power from ungrounded alternating current power systems.
77.701-2	Approved methods of grounding metallic frames, casings and other enclosures of electric equipment receiving power from a direct-current power system.
77.701-3	Grounding wires; capacity.
77.701-4	Use of grounding connectors.
77.702	Protection other than grounding.
77.703	Grounding frames of stationary high-voltage equipment receiving power from ungrounded delta systems.
77.703-1	Approved methods of grounding.
77.704	Work on high-voltage lines; de-energizing and grounding.
77.704-1	Work on high-voltage lines.
77.704-2	Repairs to energized high-voltage lines.
77.704-3	Work on energized high-voltage surface lines; reporting.
77.704-4	Simultaneous repairs.
77.704-5	Installation of protective equipment.
77.704-6	Protective clothing; use and inspection.
77.704-7	Protective equipment; inspection.
77.704-8	Protective equipment; testing and storage.
77.704-9	Operating disconnecting or cut-out switches.
77.704-10	Tying into energized high-voltage surface circuits.
77.704-11	Use of grounded messenger wires; ungrounded systems.
77.705	Guy wires; grounding.

Subpart I—Surface High-Voltage Distribution

77.800	High-voltage circuits; circuit breakers.
77.800-1	Testing, examination, and maintenance of circuit breakers; procedures.
77.800-2	Testing, examination, and maintenance of circuit breakers; record.
77.801	Grounding resistors.
77.801-1	Grounding resistors; continuous current rating.
77.802	Protection of high-voltage circuits; neutral grounding resistors; disconnecting devices.
77.803	Fail safe ground check circuits on high-voltage resistance grounded systems.
77.803-1	Fail safe ground check circuits; maximum voltage.
77.803-2	Ground check systems not employing pilot check wires; approval by the Secretary.
77.804	High-voltage trailing cables; minimum design requirements.
77.805	Cable couplers and connection boxes; minimum design requirements.
77.806	Connection of single-phase loads.
77.807	Installation of high-voltage transmission cables.
77.807-1	High-voltage power lines; clearances above ground.
77.807-2	Booms and masts; minimum distance from high-voltage lines.
77.807-3	Movement of equipment; minimum distance from high-voltage lines.
77.808	Disconnecting devices.
77.809	Identification of circuit breakers and disconnecting switches.
77.810	High-voltage equipment; grounding.
77.811	Movement of portable substations and transformers.

Subpart J—Low- and Medium-Voltage Alternating Current Circuits

Sec.	
77.900	Low- and medium-voltage circuits serving portable or mobile three-phase alternating current equipment; circuit breakers.
77.900-1	Testing, examination, and maintenance of circuit breakers; procedures.
77.900-2	Testing, examination, and maintenance of circuit breakers; record.
77.901	Protection of low- and medium-voltage three-phase circuits.
77.901-1	Grounding resistor; continuous current rating.
77.902	Low- and medium-voltage ground check monitor circuits.
77.902-1	Fail safe ground check circuits; maximum voltage.
77.902-2	Approved ground check systems not employing pilot check wires.
77.902-3	Attachment of ground conductors and ground check wires to equipment frames; use of separate connections.
77.903	Disconnecting devices.
77.904	Identification of circuit breakers.
77.905	Connection of single-phase loads.
77.906	Trailing cables supplying power to low-voltage mobile equipment; ground wires and ground check wires.

Subpart K—Ground Control

77.1000	Highwalls, pits, and spoil banks; plans.
77.1000-1	Filing of plan.
77.1001	Stripping; loose material.
77.1002	Box cuts; spoil material placement.
77.1003	Benching.
77.1004	Ground control; inspection and maintenance; general.
77.1005	Scaling highwalls; general.
77.1006	Highwalls; men working.
77.1007	Drilling; general.
77.1008	Relocation of drills; safeguards.
77.1009	Drill; operation.
77.1010	Collaring holes.
77.1011	Drill holes; guarding.
77.1012	Jackhammers; operation; safeguards.
77.1013	Air drills; safeguards.

Subpart L—Fire Protection

77.1100	Fire protection; training and organization.
77.1101	Escape and evacuation; plan.
77.1102	Warning signs; smoking and open flame.
77.1103	Flammable liquids; storage.
77.1104	Accumulations of combustible materials.
77.1105	Internal combustion engines; fueling.
77.1106	Battery charging stations; ventilation.
77.1107	Belt conveyors.
77.1108	Firefighting equipment; requirements; general.
77.1108-1	Type and capacity of firefighting equipment.
77.1109	Quantity and location of firefighting equipment.
77.1110	Examination and maintenance of firefighting equipment.
77.1111	Welding, cutting, soldering; use of fire extinguisher.
77.1112	Welding, cutting, soldering with arc or flame; safeguards.

Subpart M—Maps

77.1200	Mine map.
77.1201	Certification of mine maps.
77.1202	Availability of mine map.

Subpart N—Explosives and Blasting

Sec.	
77.1300	Explosives and blasting.
77.1301	Explosives; magazines.
77.1302	Vehicles used to transport explosives.
77.1303	Explosives; handling and use.
77.1304	Blasting agents; special provisions.

Subpart O—Man Hoisting

77.1400	Man hoists and elevators.
77.1401	Automatic controls and brakes.
77.1402	Rated capacity.
77.1402-1	Ropes and cables; specifications.
77.1402-2	Maximum load; posting.
77.1403	Inspection and maintenance.

Subpart P—Auger Mining

77.1500	Auger mining; planning.
77.1501	Auger mining; inspections.
77.1502	Auger holes; restriction against entering.
77.1503	Augering equipment; overhead protection.
77.1504	Auger equipment; operation.
77.1505	Auger holes; blocking.

Subpart Q—Loading and Haulage

77.1600	Loading and haulage; general.
77.1601	Transportation of persons; restrictions.
77.1602	Use of aerial tramways to transport persons.
77.1603	Trains and locomotives; authorized persons.
77.1604	Transportation of persons; overcrowding.
77.1605	Loading and haulage equipment; installations.
77.1606	Loading and haulage equipment; inspection and maintenance.
77.1607	Loading and haulage equipment; operation.
77.1608	Dumping facilities.

Subpart R—Miscellaneous

77.1700	Communications in work areas.
77.1701	Emergency communications; requirements.
77.1702	Arrangements for emergency medical assistance and transportation for injured persons; reporting requirements; posting requirements.
77.1703	First aid training; supervisory employees.
77.1704	First aid training program; availability of instruction to all miners.
77.1705	First aid training program; retraining of supervisory employees; availability to all miners.
77.1706	First aid training program; minimum requirements.
77.1707	First aid equipment; location; minimum requirements.
77.1708	Safety program, instruction of persons employed at the mine.
77.1709	Safety training; inexperienced employees.
77.1710	Protective clothing; requirements.
77.1711	Smoking prohibition.
77.1712	Reopening mines; notification; inspection prior to mining.
77.1713	Daily inspection of surface coal mine; certified person; reports of inspection.

Subpart S—Trolley Wires and Trolley Feeder Wires

77.1800	Cutout switches.
77.1801	Overcurrent protection.
77.1801-1	Devices for overcurrent protection.

Sec.
77.1802 Insulation of trolley wires, trolley feeder wires and bare signal wires; guarding of trolley wires and trolley feeder wires.

Subpart T—Slope and Shaft Sinking

77.1900 Slopes and shafts; approval of plans.
77.1900-1 Compliance with approved slope and shaft sinking plans.
77.1901 Preshift and onshift inspections; reports.
77.1901-1 Methane and oxygen deficiency tests; approved devices.
77.1902 Drilling and mucking operations.
77.1902-1 Permissible diesel-powered equipment.
77.1903 Hoists and hoisting; minimum requirements.
77.1904 Communications between slope and shaft bottoms and hoist operators.
77.1905 Hoist safeguards; general.
77.1906 Hoists; daily inspection.
77.1907 Hoist construction; general.
77.1908 Hoist installations; use.
77.1908-1 Hoist operation; qualified hoisting engineer.
77.1909 Explosives and blasting; use of permissible explosives and shot-firing units.
77.1909-1 Use of nonpermissible explosives and nonpermissible shot-firing units; approval by Health and Safety District Manager.
77.1910 Explosives and blasting; general.
77.1911 Ventilation of slopes and shafts.
77.1912 Ladders and stairways.
77.1913 Fire-resistant wood.
77.1914 Electrical equipment.
77.1915 Storage and handling of combustible materials.
77.1916 Welding, cutting, and soldering; fire protection.

Subpart U—Approved Books and Records

77.2000 through 77.2099 [Reserved]

AUTHORITY: The mandatory safety standards for surface coal mines and surface work areas of underground coal mines set forth in this Part 77 are issued in accordance with the authority vested in the Secretary of the Interior under the provisions of §§ 101(1) and 508 of the Federal Coal Mine Health and Safety Act of 1969 (83 Stat. 742; 30 U.S.C. 801; Public Law 91-173).

Subpart A—General

§ 77.1 Scope.

This Part 77 sets forth mandatory safety standards for bituminous, anthracite, and lignite surface coal mines, including open pit and auger mines, and to the surface work areas of underground coal mines, pursuant to section 101(i) of the Federal Coal Mine Health and Safety Act of 1969.

§ 77.2 Definitions.

For the purpose of this Part 77, the term:

(a) "Active workings" means any place in a coal mine where miners are normally required to work or travel;

(b) "American Table of Distances" means the current edition of "The American Table of Distances for Storage of Explosives" published by the Institute of Makers of Explosives;

(c) "Barricaded" means to obstruct passage of persons, vehicles, or flying materials;

(d) "Berm" means a pile or mound of material capable of restraining a vehicle;

(e) "Blasting agent" means any material consisting of a mixture of a fuel and oxidizer which—

(1) Is used or intended for use in blasting;

(2) Is not classed as an explosive by the Department of Transportation;

(3) Contains no ingredient classed as an explosive by the Department of Transportation; and,

(4) Cannot be detonated by a No. 8 blasting cap when tested as recommended in Bureau of Mines Information Circular 8179.

(f) "Blasting area" means the area near blasting operations in which concussion or flying material can reasonably be expected to cause injury.

(g) "Blasting cap" means a detonator containing a charge of detonating compound, which is ignited by electric current, or the spark of a fuse. Used for detonating explosives.

(h) "Blasting circuit" means electric circuits used to fire electric detonators or to ignite an igniter cord by means of an electric starter.

(i) "Blasting switch" means a switch used to connect a power source to a blasting circuit.

(j) "Box-type magazine" means a small, portable magazine used to store limited quantities of explosives or detonators for short periods of time in locations at the mine which are convenient to the blasting sites at which they will be used.

(k) "Capped fuse" means a length of safety fuse to which a detonator has been attached.

(l) "Capped primer" means a package or cartridge of explosives which is specifically designed to transmit detonation to other explosives and which contains a detonator.

(m) "Certified" or "registered", as applied to any person means a person certified or registered by the State in which the coal mine is located to perform duties prescribed by this Part 77, except that, in a State where no program of certification or registration is provided or where the program does not meet at least minimum Federal standards established by the Secretary, such certification or registration shall be by the Secretary.

(n) "Detonating cord" or "detonating fuse" means a flexible cord containing a core of high explosive.

(o) "Detonator" means a device containing a small detonating charge that is used for detonating an explosive, including, but not limited to blasting caps, exploders, electric detonators, and delay electric blasting caps.

(p) "Electrical grounding" means to connect with the ground to make the earth part of the circuit.

(q) "Explosive" means any chemical compound, mixture, or device, the primary or common purpose of which is to function by explosion. Explosives include, but are not limited to black powder, dynamite, nitroglycerin, fulminate,

ammonium nitrate when mixed with a hydrocarbon, and other blasting agents.

(r) "Flash point" means the minimum temperature at which sufficient vapor is released by a liquid or solid to form a flammable vapor-air mixture at atmospheric pressure.

(s) "Low voltage" means up to and including 660 volts, "medium voltage" means voltages from 661 to 1,000 volts, and "high voltage" means more than 1,000 volts.

(t) "Misfire" means the complete or partial failure of a blasting charge to explode as planned.

(u) "Primer" or "Booster" means a package or cartridge of explosive which is designed specifically to transmit detonation to other explosives and which does not contain a detonator.

(v) "Qualified person" means, as the context requires,

(1) An individual deemed qualified by the Secretary and designated by the operator to make tests and examinations required by this Part 77; and,

(2) An individual deemed, in accordance with the minimum requirements to be established by the Secretary, qualified by training, education, and experience, to perform electrical work, to maintain electrical equipment, and to conduct examinations and make tests of all electrical equipment.

(w) "Roll protection" means a frame-work, safety canopy, or similar protection for the operator when equipment overturns.

(x) "Safety can" means an approved container, of not over 5 gallons capacity, having a spring-closing lid and spout cover.

(y) "Safety fuse" means a train of powder enclosed in cotton, jute yarn, and waterproofing compounds, which burns at a uniform rate; used for firing a cap containing the detonating compound which in turn sets off the explosive charge.

(z) "Safety switch" means a section-alizing switch that also provides shunt protection in blasting circuits between the blasting switch and the shot area.

(aa) "Secretary" means the Secretary of the Interior or his delegate.

Subpart B—Qualified and Certified Persons

§ 77.100 Certified person.

(a) (1) The provisions of this Part 77 require that certain examinations and tests be made by a certified person. A certified person within the meaning of these provisions is a person who has been certified in accordance with the provisions of paragraph (b) of this § 77.100 to perform the duties, and make the examinations and tests which are required by this Part 77 to be performed by a certified person.

(2) A person who has been so certified shall also be considered to be a qualified person within the meaning of those provisions of this Part 77 which require that certain examinations, tests and duties be performed by a qualified person, except those provisions in Subparts F, G,

H, I, and J of this part relating to performance of electrical work.

(b) Pending issuance of Federal standards, a person will be considered, to the extent of the certification, a certified person to make examinations, tests and perform duties which are required by this Part 77 to be performed by a certified person:

(1) If he has been certified for such purpose by the State in which the coal mine is located; or

(2) If he has been temporarily certified for such purpose by the Secretary for periods of time not to exceed 6 months for each such temporary certification. The operator of the coal mine in which such person is employed shall make an application and a satisfactory showing that each such person has had at least 2 years experience at a coal mine or equivalent experience and such person demonstrates to the satisfaction of an authorized representative of the Secretary that he is able and competent to test for oxygen deficiency with a permissible flame safety lamp and to test for methane with a portable methane detector approved by the Bureau of Mines under Part 22 of this chapter (Bureau of Mines Schedule 8C), and to perform such other duties for which application for certification is made. Applications for temporary certification by the Secretary should be submitted in writing to the Health and Safety Activity, Bureau of Mines, Department of the Interior, 4800 Forbes Avenue, Pittsburgh, PA 15213.

§ 77.101 Tests for methane and for oxygen deficiency; qualified person.

(a) The provisions of Subparts C, P, R, and T of this Part 77 require that tests for methane and for oxygen deficiency be made by a qualified person. A person is a qualified person for these purposes if he is a certified person for such purposes under § 77.100.

(b) Pending issuance of Federal standards, a person will be considered a qualified person for testing for methane and oxygen deficiency:

(1) If he has been qualified for this purpose by the State in which the coal mine is located; or

(2) If he has been qualified by the Secretary for these purposes upon a satisfactory showing by the operator of the coal mine that each such person has been trained and designated by the operator to test for methane and oxygen deficiency. Applications for Secretarial qualification should be submitted in writing to the Health and Safety Activity, Bureau of Mines, 4800 Forbes Avenue, Pittsburgh, PA 15213.

§ 77.102 Tests for methane; oxygen deficiency; qualified person, additional requirement.

Notwithstanding the provisions of § 77.101, on and after December 30, 1971, no person shall be a qualified person for testing for methane and oxygen deficiency unless he has demonstrated to the satisfaction of an authorized representative of the Secretary that he is able and competent to make such tests and

the Bureau of Mines has issued him a current card which qualifies him to make such tests.

§ 77.103 Electrical work; qualified person.

(a) An individual is a qualified person within the meaning of Subparts F, G, H, I, and J of this Part 77, to perform electrical work (other than work on energized surface high-voltage lines) if he has been qualified as a mine electrician by the State in which the mine is located and if the State required, as a condition of qualification at least 1 year experience in performing electrical work.

(b) If the State in which the mine is located does not require as a condition of qualification at least 1 year experience in performing electrical work or if a State has no program for qualifying persons as mine electricians, the Secretary, pending issuance of Federal standards which will give recognition to practical experience, may temporarily qualify persons for this purpose, for periods of time not to exceed 6 months, for each temporary qualification if the operator of the coal mine in which such persons are employed makes an application and a satisfactory showing that each such person:

(1) Has been performing electrical work, including the inspection, testing, and maintenance of electrical equipment and circuits, for 1 year preceding the application; or

(2) Has equivalent experience. Applications for temporary Secretarial qualification and renewals for an additional 6 months should be submitted in writing to the Health and Safety Activity, Bureau of Mines, Department of the Interior, 4800 Forbes Avenue, Pittsburgh, PA 15213.

§ 77.104 Repair of energized surface high-voltage lines; qualified person.

An individual is a qualified person within the meaning of § 77.104 of this part for the purpose of repairing energized surface high-voltage lines only if he has had at least 2 years experience in electrical maintenance, and at least 2 years experience in the repair of energized high-voltage lines located on poles or structures.

§ 77.105 Qualified hoistman; slope or shaft sinking operation; qualifications.

(a) (1) A person is a qualified hoistman within the provisions of Subpart T of this part, for the purpose of operating a hoist at a slope or shaft sinking operation if he has at least 1 year experience operating a hoist plant or maintaining hoist equipment and is qualified by any State as a hoistman or its equivalency, or

(2) If a State has no program for qualifying persons as a hoistman, the Secretary may temporarily qualify persons for this purpose for periods of time not to exceed 6 months for each temporary certification if the operator of the slope or shaft sinking operation makes an application and a satisfactory showing

that each such person has had 1 year experience in the operation of hoists.

(b) Applications for Secretarial qualification should be submitted to the Health and Safety Activity, Bureau of Mines, Department of the Interior, 4800 Forbes Avenue, Pittsburgh, PA 15213.

§ 77.106 Records of certified and qualified persons.

The operator of each coal mine shall maintain a list of all certified and qualified persons designated to perform duties under this Part 77.

§ 77.107 Training programs.

Every operator of a coal mine shall provide a program, approved by the Secretary, of training and retraining both qualified and certified persons needed to carry out functions prescribed in the Act.

§ 77.107-1 Plans for training programs.

On or before June 30, 1971, each operator shall submit to the District Manager of the Coal Mine Health and Safety District in which the mine is located a program or plan setting forth what, when, how, and where he will train and retrain persons whose work assignments require that they be certified or qualified. Such program shall provide: (a) For certified persons, annual training courses in the tasks and duties which they perform as certified persons, first aid, principles of mine rescue, and the provisions of this Part 77; and (b) for qualified persons, annual courses in performance of the tasks which they perform as qualified persons.

Subpart C—Surface Installations

§ 77.200 Surface installations; general.

All mine structures, enclosures, or other facilities (including custom coal preparation) shall be maintained in good repair to prevent accidents and injuries to employees.

§ 77.201 Methane content in surface installations.

The methane content in the air of any structure, enclosure or other facility shall be less than 1.0 volume per centum.

§ 77.201-1 Tests for methane; qualified person; use of approved device.

Tests for methane in structures, enclosures, or other facilities, in which coal is handled or stored shall be conducted by a qualified person with a device approved by the Secretary at least once during each operating shift, and immediately prior to any repair work in which welding or an open flame is used, or a spark may be produced.

§ 77.201-2 Methane accumulations; change in ventilation.

If, at any time, the air in any structure, enclosure or other facility contains 1.0 volume per centum or more of methane changes or adjustments in the ventilation of such installation shall be made at once so that the air shall contain

less than 1.0 volume per centum of methane.

§ 77.202 Dust accumulations in surface installations.

Coal dust in the air of, or in, or on the surfaces of, structures, enclosures, or other facilities shall not be allowed to exist or accumulate in dangerous amounts.

§ 77.203 Use of material or equipment overhead; safeguards.

Where overhead repairs are being made at surface installations and equipment or material is taken into such overhead work areas, adequate protection shall be provided for all persons working or passing below the overhead work areas in which such equipment or material is being used.

§ 77.204 Openings in surface installations; safeguards.

Openings in surface installations through which men or material may fall shall be protected by railings, barriers, covers or other protective devices.

§ 77.205 Travelways at surface installations.

(a) Safe means of access shall be provided and maintained to all working places.

(b) Travelways and platforms or other means of access to areas where persons are required to travel or work, shall be kept clear of all extraneous material and other stumbling or slipping hazards.

(c) Inclined travelways shall be constructed of nonskid material or equipped with cleats.

(d) Regularly used travelways shall be sanded, salted, or cleared of snow and ice as soon as practicable.

(e) Crossovers, elevated walkways, elevated ramps, and stairways shall be of substantial construction, provided with handrails, and maintained in good condition. Where necessary toeboards shall be provided.

(f) Crossovers shall be provided where it is necessary to cross conveyors.

(g) Moving conveyors shall be crossed only at designated crossover points.

§ 77.206 Ladders; construction; installation and maintenance.

(a) Ladders shall be of substantial construction and maintained in good condition.

(b) Wooden members of ladders shall not be painted.

(c) Steep or vertical ladders which are used regularly at fixed locations shall be anchored securely and provided with backguards extending from a point not more than 7 feet from the bottom of the ladder to the top of the ladder.

(d) Fixed ladders shall not incline backwards at any point unless provided with backguards.

(e) Fixed ladders shall be anchored securely and installed to provide at least 3 inches of toe clearance.

(f) Fixed ladders shall project at least 3 feet above landings, or substantial handholds shall be provided above the landings.

§ 77.207 Illumination.

Illumination sufficient to provide safe working conditions shall be provided in and on all surface structures, paths, walkways, stairways, switch panels, loading and dumping sites, and working areas.

§ 77.208 Storage of materials.

(a) Materials shall be stored and stacked in a manner which minimizes stumbling or fall-of-material hazards.

(b) Materials that can create hazards if accidentally liberated from their containers shall be stored in a manner that minimizes the dangers.

(c) Hazardous materials shall be stored in containers of a type approved for such use by recognized agencies; such containers shall be labeled appropriately.

(d) Compressed and liquid gas cylinders shall be secured in a safe manner.

(e) Valves on compressed gas cylinders shall be protected by covers when being transported or stored, and by a safe location when the cylinders are in use.

§ 77.209 Surge and storage piles.

No person shall be permitted to walk or stand immediately above a reclaiming area or in any other area at or near a surge or storage pile where the reclaiming operation may expose him to a hazard.

§ 77.210 Hoisting of materials.

(a) Hitches and slings used to hoist materials shall be suitable for handling the type of materials being hoisted.

(b) Men shall stay clear of hoisted loads.

(c) Taglines shall be attached to hoisted materials that require steadying or guidance.

§ 77.211 Draw-off tunnels; stockpiling and reclaiming operations; general.

(a) Tunnels located below stockpiles, surge piles, and coal storage silos shall be ventilated so as to maintain concentrations of methane below 1.0 volume per centum.

(b) In addition to the tests for methane required by § 77.201 such tests shall also be made before any electric equipment is energized or repaired, unless equipped with a continuous methane monitoring device installed and operated in accordance with the provisions of § 77.211-1. Electric equipment shall not be energized, operated, or repaired until the air contains less than 1.0 volume per centum of methane.

§ 77.211-1 Continuous methane monitoring device; installation and operation; automatic deenergization of electric equipment.

Continuous methane monitoring devices shall be set to deenergize automatically electric equipment when such monitor is not operating properly and to give a warning automatically when the concentration of methane reaches a maximum percentage determined by an authorized representative of the Secretary

which shall not be more than 1.0 volume per centum of methane. An authorized representative of the Secretary shall require such monitor to deenergize automatically electric equipment when the concentration of methane reaches a maximum percentage determined by such representative which shall not be more than 2.0 volume per centum of methane.

§ 77.212 Draw-off tunnel ventilation fans; installation.

When fans are used to ventilate draw-off tunnels the fans shall be:

- (a) Installed on the surface;
- (b) Installed in fireproof housings and connected to the tunnel openings with fireproof air ducts; and,
- (c) Offset from the tunnel opening.

§ 77.213 Draw-off tunnel escapeways.

When it is necessary for a tunnel to be closed at one end, an escapeway not less than 30 inches in diameter (or of the equivalent, if the escapeway does not have a circular cross section) shall be installed which extends from the closed end of the tunnel to a safe location on the surface; and, if the escapeway is inclined more than 30 degrees from the horizontal it shall be equipped with a ladder which runs the full length of the inclined portion of the escapeway.

§ 77.214 Refuse piles; general.

(a) Refuse piles constructed on or after June 30, 1971, shall be located in areas which are a safe distance from all underground mine airshafts, preparation plants, tipples, or other surface installations and such piles shall not be located over abandoned openings or steamlines.

(b) Where new refuse piles are constructed over exposed coal beds the exposed coal shall be covered with clay or other inert material as the piles are constructed.

(c) A fireproof barrier of clay or inert material shall be constructed between old and new refuse piles.

(d) Roadways to refuse piles shall be fenced or otherwise guarded to restrict the entrance of unauthorized persons.

§ 77.215 Refuse piles; construction requirements.

(a) Refuse deposited on a pile shall be spread in layers and compacted in such a manner so as to minimize the flow of air through the pile.

(b) Refuse shall not be deposited on a burning pile except for the purpose of controlling or extinguishing a fire.

(c) Clay or other sealants shall be used to seal the surface of any refuse pile in which a spontaneous ignition has occurred.

(d) Surface seals shall be kept intact and protected from erosion by drainage facilities.

(e) Refuse piles shall not be constructed so as to impede drainage or impound water.

(f) Refuse piles shall be constructed in such a manner as to prevent accidental sliding and shifting of materials.

(g) No extraneous combustible material shall be deposited on refuse piles.

§ 77.216 Retaining dams; construction; inspection; records.

(a) If failure of a water or silt retaining dam will create a hazard, it shall be of substantial construction and shall be inspected at least once each week.

(b) Weekly inspections conducted pursuant to paragraph (a) of this § 77.216 shall be reported and the report shall be countersigned by any of the persons listed in paragraph (d) of § 77.1713.

Subpart D—Thermal Dryers

§ 77.300 Thermal dryers; general.

On and after June 30, 1971 dryer systems used for drying coal at high temperatures, hereinafter referred to as thermal dryers, including rotary dryers, continuous carrier dyes, vertical tray, and cascade dryers, multilouver dryers, suspension or flash dryers, and fluidized bed dryers, shall be maintained and operated in accordance with the provision of § 77.301 to § 77.306.

§ 77.301 Dryer heating units; operation.

(a) Dryer heating units shall be operated to provide reasonably complete combustion before heated gases are allowed to enter hot gas inlets.

(b) Dryer heating units which are fired by pulverized coal, shall be operated and maintained in accordance with the recommended standards set forth in the National Fire Protection Association Handbook, 12th Edition, Section 9, "Installation of Pulverized Fuel Systems," 1962.

§ 77.302 Bypass stacks.

Thermal dryer systems shall include a bypass stack, relief stack or individual discharge stack provided with automatic venting which will permit gases from the dryer heating unit to bypass the heating chamber and vent to the outside atmosphere during any shutdown operation.

§ 77.303 Hot gas inlet chamber dropout doors.

Thermal dryer systems which employ a hot gas inlet chamber shall be equipped with drop-out doors at the bottom of the inlet chamber or with other effective means which permit coal, fly-ash, or other heated material to fall from the chamber.

§ 77.304 Explosion release vents.

Drying chambers, dry-dust collectors, ductwork connecting dryers to dust collectors, and ductwork between dust collectors and discharge stacks shall be protected with explosion release vents which open directly to the outside atmosphere, and all such vents shall be:

- (a) Hinged to prevent dislodgment;
- (b) Designed and constructed to permit checking and testing by manual operation; and
- (c) Equal in size to the cross-sectional area of the collector vortex finder when used to vent dry dust collectors.

§ 77.305 Access to drying chambers, hot gas inlet chambers and ductwork; installation and maintenance.

Drying chambers, hot gas inlet chambers and all ductwork in which coal dust may accumulate shall be equipped with tight sealing access doors which shall remain latched during dryer operation to prevent the emission of coal dust and the loss of fluidizing air.

§ 77.306 Fire protection.

Based on the need for fire protection measures in connection with the particular design of the thermal dryer, an authorized representative of the Secretary may require any of the following measures to be employed:

(a) Water sprays automatically actuated by rises in temperature to prevent fire, installed inside the thermal dryer systems, and such sprays shall be designed to provide for manual operation in the event of power failure.

(b) Fog nozzles, or other no less effective means, installed inside the thermal dryer systems to provide additional moisture or an artificial drying load within the drying system when the system is being started or shutdown.

(c) The water system of each thermal dryer shall be interconnected to a supply of compressed air which permits constant or frequent purging of all water sprays and fog nozzles or other no less effective means of purging shall be provided.

§ 77.307 Thermal dryers; location and installation; general.

(a) Thermal dryer systems erected or installed at any coal mine after June 30, 1971 shall be located at least 100 feet from any underground coal mine opening, and 100 feet from any surface installation where the heat, sparks, flames, or coal dust from the system might cause a fire or explosion.

(b) Thermal dryer systems erected or installed after June 30, 1971 may be covered by roofs, however, such systems shall not be otherwise enclosed unless necessary to protect the health and safety of persons employed at the mine. Where such systems are enclosed, they shall be located in separate fireproof structures of heavy construction with explosion pressure release devices (such as hinged wall panels, window sashes, or louvers), which provide at least 1 square foot of area for each 80 cubic feet of space volume and which are distributed as uniformly as possible throughout the structure.

§ 77.308 Structures housing other facilities; use of partitions.

Thermal dryer systems installed after June 30, 1971 in any structure which also houses a tipple, cleaning plant, or other operating facility shall be separated from all other working areas of such structure by a substantial partition capable of providing greater resistance to explosion pressures than the exterior wall or walls of the structure. The partition shall also include substantial, self-closing fire doors

at all entrances to the areas adjoining the dryer system.

§ 77.309 Visual check of system equipment.

Frequent visual checks shall be made by the operator of the thermal dryer system control station, or by some other competent person, of the bypass dampers, air-tempering louvers, discharge mechanism, and other dryer system equipment.

§ 77.309-1 Control stations; location.

Thermal dryer system control stations constructed after June 30, 1971, shall be installed at a location which will give to the operator of the control station the widest field of visibility of the system and equipment.

§ 77.310 Control panels.

(a) All thermal dryer system control panels constructed after June 30, 1971 shall be located in an area which is relatively free of moisture and dust and shall be installed in such a manner as to minimize vibration.

(b) A schematic diagram containing legends which show the location of each thermocouple, pressure tap, or other control or gaging instrument in the drying system shall be posted on or near the control panel of each thermal drying system.

(c) Each instrument on the control panel shall be identified by a nameplate or equivalent marking.

(d) A plan to control the operation of each thermal dryer system shall be posted at or near the control panel showing a sequence of startup, normal shutdown, and emergency shutdown procedures.

§ 77.311 Alarm devices.

Thermal dryer systems shall be equipped with both audible and visual alarm devices which are set to operate when safe dryer temperatures are exceeded.

§ 77.312 Fail safe monitoring systems.

Thermal dryer systems and controls shall be protected by a fail safe monitoring system which will safely shut down the system and any related equipment upon failure of any component in the dryer system.

§ 77.313 Wet-coal feedbins; low-level indicators.

Wet-coal bins feeding thermal drying systems shall be equipped with both audible and visual low-coal-level indicators.

§ 77.314 Automatic temperature control instruments.

(a) Automatic temperature control instruments for thermal dryer system shall be of the recording type.

(b) Automatic temperature control instruments shall be locked or sealed to prevent tampering or unauthorized adjustment. These instruments shall not be set above the maximum allowable operating temperature.

(c) All dryer control instruments shall be inspected and calibrated at least once every 3 months and a record or certificate of accuracy, signed by a trained employee or by a servicing agent, shall be kept at the plant.

§ 77.315 Thermal dryers; examination and inspection.

Thermal dryer systems shall be examined for fires and coal-dust accumulations if the dryers are not restarted promptly after a shutdown.

Subpart E—Safeguards for Mechanical Equipment

§ 77.400 Mechanical equipment guards.

(a) Gears; sprockets; chains; drive, head, tail, and take-up pulleys; flywheels; couplings; shafts; sawblades; fan inlets; and similar exposed moving machine parts which may be contacted by persons, and which may cause injury to persons shall be guarded.

(b) Overhead belts shall be guarded if the whipping action from a broken line would be hazardous to persons below.

(c) Guards at conveyor-drive, conveyor-head, and conveyor-tail pulleys shall extend a distance sufficient to prevent a person from reaching behind the guard and becoming caught between the belt and the pulley.

(d) Except when testing the machinery, guards shall be securely in place while machinery is being operated.

§ 77.401 Stationary grinding machines; protective devices.

(a) Stationary grinding machines other than special bit grinders shall be equipped with:

(1) Peripheral hoods (less than 90° throat openings) capable of withstanding the force of a bursting wheel.

(2) Adjustable tool rests set as close as practical to the wheel.

(3) Safety washers.

(b) Grinding wheels shall be operated within the specifications of the manufacturer of the wheel.

(c) Face shields or goggles, in good condition, shall be worn when operating a grinding wheel.

§ 77.402 Hand-held power tools; safety devices.

Hand-held power tools shall be equipped with controls requiring constant hand or finger pressure to operate the tools or shall be equipped with friction or other equivalent safety devices.

§ 77.403 Mobile equipment; canopies and roll protection.

Forklift trucks, front-end loaders, and bulldozers shall be provided with substantial canopies and roll protection when necessary to protect the operator.

§ 77.404 Machinery and equipment; operation and maintenance.

(a) Mobile and stationary machinery and equipment shall be maintained in safe operating condition and machinery or equipment in unsafe condition shall be removed from service immediately.

(b) Machinery and equipment shall be operated only by persons trained in the

use of and authorized to operate such machinery or equipment.

(c) Repairs or maintenance shall not be performed on machinery until the power is off and the machinery is blocked against motion, except where machinery motion is necessary to make adjustments.

(d) Machinery shall not be lubricated while in motion where a hazard exists, unless equipped with extended fittings or cups.

§ 77.405 Performing work from a raised position; safeguards.

(a) Men shall not work on or from a piece of mobile equipment in a raised position until it has been blocked in place securely. This does not preclude the use of equipment specifically designed as elevated mobile work platforms.

(b) No work shall be performed under machinery or equipment that has been raised until such machinery or equipment has been securely blocked in position.

§ 77.406 Drive belts.

(a) Drive belts shall not be shifted while in motion unless the machines are provided with mechanical shifters.

(b) Belt dressing shall not be applied while belts are in motion except where it can be applied without endangering a person.

§ 77.407 Power-driven pulleys.

(a) Belts, chains, and ropes shall not be guided onto power-driven moving pulleys, sprockets, or drums with the hands except on slow moving equipment especially designed for hand feeding.

(b) Pulleys of conveyors shall not be cleaned manually while the conveyor is in motion.

§ 77.408 Welding operations.

Welding operations shall be shielded and the area shall be well-ventilated.

§ 77.409 Shovels, draglines, and tractors.

(a) Shovels, draglines, and tractors shall not be operated in the presence of any person exposed to a hazard from its operation and all such equipment shall be provided with an adequate warning device which shall be sounded by the operator prior to starting operation.

(b) Shovels and draglines shall be equipped with handrails along and around all walkways and platforms.

§ 77.410 Mobile equipment; automatic warning devices.

Mobile equipment, such as trucks, forklifts, front-end loaders, tractors and graders, shall be equipped with an adequate automatic warning device which shall give an audible alarm when such equipment is put in reverse.

§ 77.411 Compressed air and boilers; general.

All boilers and pressure vessels shall be constructed, installed, and maintained in accordance with the standards and specifications of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code.

§ 77.412 Compressed air systems.

(a) Compressors and compressed-air receivers shall be equipped with automatic pressure-relief valves, pressure gages, and drain valves.

(b) Repairs involving the pressure system of compressors, receivers, or compressed-air-powered equipment shall not be attempted until the pressure has been relieved from that part of the system to be repaired.

(c) At no time shall compressed air be directed toward a person. When compressed air is used, all necessary precautions shall be taken to protect persons from injury.

(d) Safety chains or suitable locking devices shall be used at connections to machines of high-pressure hose lines of 1-inch inside diameter or larger, and between high-pressure hose lines of 1-inch inside diameter or larger, where a connection failure would create a hazard.

§ 77.413 Boilers.

(a) Boilers shall be equipped with guarded, well-maintained water gages and pressure gages placed so that they can be observed easily. Water gages and pipe passages to the gages shall be kept clean and free of scale and rust.

(b) Boilers shall be equipped with automatic pressure-relief valves; valves shall be opened manually at least once a week to determine that they will function properly.

(c) Blowoff valves shall be piped outside the building and shall have outlets so located or protected that persons passing by, near, or under them will not be scalded.

(d) Boiler installations shall be provided with safety devices, acceptable to the Bureau of Mines, to protect against hazards of flame outs, fuel interruptions, and low-water level.

(e) Boilers shall be inspected internally at least once a year by a licensed inspector and a certificate of inspection signed by the inspector shall be displayed in the vicinity of the boiler.

Subpart F—Electrical Equipment—General

§ 77.500 Electric power circuits and electric equipment; deenergization.

Power circuits and electric equipment shall be deenergized before work is done on such circuits and equipment, except when necessary for troubleshooting or testing.

§ 77.501 Electric distribution circuits and equipment; repair.

No electrical work shall be performed on electric distribution circuits or equipment, except by a qualified person or by a person trained to perform electrical work and to maintain electrical equipment under the direct supervision of a qualified person. Disconnecting devices shall be locked out and suitably tagged by the persons who perform such work, except that in cases where locking out is not possible, such devices shall be opened and suitably tagged by such persons.

Locks or tags shall be removed only by the persons who installed them or, if such persons are unavailable, by persons authorized by the operator or his agent.

§ 77.501-1 Qualified person.

A qualified person within the meaning of § 77.501 is an individual who meets the requirements of § 77.103.

§ 77.502 Electric equipment; examination, testing, and maintenance.

Electric equipment shall be frequently examined, tested, and properly maintained by a qualified person to assure safe operating conditions. When a potentially dangerous condition is found on electric equipment, such equipment shall be removed from service until such condition is corrected. A record of such examinations shall be kept.

§ 77.502-1 Qualified person.

A qualified person within the meaning of § 77.502 is an individual who meets the requirements of § 77.103.

§ 77.502-2 Electric equipment; frequency of examination and testing.

The examinations and tests required under the provision of this § 77.502 shall be conducted at least monthly.

§ 77.503 Electric conductors; capacity and insulation.

Electric conductors shall be sufficient in size and have adequate current carrying capacity and be of such construction that a rise in temperature resulting from normal operation will not damage the insulating materials.

§ 77.503-1 Electric conductors.

Electric conductors shall be sufficient in size to meet the minimum current carrying capacity provided for in the National Electric Code, 1968. All trailing cables shall meet the minimum requirements for ampacity provided in the standards of the Insulated Power Cable Engineers Association—National Electric Manufacturers Association in effect when such cables are purchased.

§ 77.504 Electrical connections or splices; suitability.

Electrical connections or splices in electric conductors shall be mechanically and electrically efficient, and suitable connectors shall be used. All electrical connections or splices in insulated wire shall be reinsulated at least to the same degree of protection as the remainder of the wire.

§ 77.505 Cable fittings; suitability.

Cables shall enter metal frames of motors, splice boxes, and electric compartments only through proper fittings. When insulated wires, other than cables, pass through metal frames, the holes shall be substantially bushed with insulated bushings.

§ 77.506 Electric equipment and circuits; overload and short-circuit protection.

Automatic circuit-breaking devices or fuses of the correct type and capacity shall be installed so as to protect all

electric equipment and circuits against short circuit and overloads.

§ 77.506-1 Electric equipment and circuits; overload and short circuit protection; minimum requirements.

Devices providing either short circuit protection or protection against overload shall conform to the minimum requirements for protection of electric circuits and equipment of the National Electric Code, 1968.

§ 77.507 Electric equipment; switches.

All electric equipment shall be provided with switches or other controls that are safely designed, constructed, and installed.

§ 77.508 Lightning arresters, ungrounded and exposed power conductors and telephone wires.

All ungrounded, exposed power conductors and telephone wires shall be equipped with suitable lightning arresters which are adequately installed and connected to a low resistance grounding medium.

§ 77.508-1 Lightning arresters; wires entering buildings.

Lightning arresters protecting exposed telephone wires entering buildings shall be provided at the point where each such telephone wire enters the building.

§ 77.509 Transformers; installation and guarding.

(a) Transformers shall be of the totally enclosed type, or shall be placed at least 8 feet above the ground, or installed in a transformer house, or surrounded by a substantial fence at least 6 feet high and at least 3 feet from any energized parts, casings, or wiring.

(b) Transformer stations shall be enclosed to prevent persons from unintentionally or inadvertently contacting energized parts.

(c) Transformer enclosures shall be kept locked against unauthorized entry.

§ 77.510 Resistors; location and guarding.

Resistors, heaters, and rheostats shall be located so as to minimize fire hazards and, where necessary, provided with guards to prevent personal contact.

§ 77.511 Danger signs at electrical installations.

Suitable danger signs shall be posted at all major electrical installations.

§ 77.512 Inspection and cover plates.

Inspection and cover plates on electrical equipment shall be kept in place at all times except during testing or repairs.

§ 77.513 Insulating mats at power switches.

Dry wooden platforms, insulating mats, or other electrically nonconductive material shall be kept in place at all switchboards and power-control switches where shock hazards exist. However, metal plates on which a person normally would stand and which are kept at the same potential as the grounded, metal,

non-current-carrying parts of the power switches to be operated may be used.

§ 77.514 Switchboards; passageways and clearance.

Switchboards shall be installed to provide passageways or lanes of travel which permit access to the back of the switchboard from both ends for inspection, adjustment or repair. Openings permitting access to the rear of any switchboard shall be guarded, except where they are located in buildings which are kept locked.

§ 77.515 Bare signal or control wires; voltage.

The voltage on bare signal or control wires accessible to personal contact shall not exceed 40 volts.

§ 77.516 Electric wiring and equipment; installation and maintenance.

In addition to the requirements of § 77.503 and § 77.506, all wiring and electrical equipment installed after June 30, 1971, shall meet the requirements of the National Electric Code in effect at the time of installation.

Subpart G—Trailing Cables

§ 77.600 Trailing cables; short-circuit protection; disconnecting devices.

Short-circuit protection for trailing cables shall be provided by an automatic circuit breaker or other no less effective device, approved by the Secretary, of adequate current-interrupting capacity in each ungrounded conductor. Disconnecting devices used to disconnect power from trailing cables shall be plainly marked and identified and such devices shall be equipped or designed in such a manner that it can be determined by visual observation that the power is disconnected.

§ 77.601 Trailing cables or portable cables; temporary splices.

Temporary splices in trailing cables or portable cables shall be made in a workmanlike manner and shall be mechanically strong and well insulated. Trailing cables or portable cables with exposed wires or splices that heat or spark under load shall not be used.

§ 77.602 Permanent splicing of trailing cables.

When permanent splices in trailing cables are made, they shall be:

- (a) Mechanically strong with adequate electrical conductivity;
- (b) Effectively insulated and sealed so as to exclude moisture; and,
- (c) Vulcanized or otherwise made with suitable materials to provide good bonding to the outer jacket.

§ 77.603 Clamping of trailing cables to equipment.

Trailing cables shall be clamped to machines in a manner to protect the cables from damage and to prevent strain on the electrical connections.

§ 77.604 Protection of trailing cables.

Trailing cables shall be adequately protected to prevent damage by mobile equipment.

§ 77.605 Breaking trailing cable and power cable connections.

Trailing cable and power cable connections between cables and to power sources shall not be made or broken under load.

§ 77.606 Energized trailing cables; handling.

Energized medium- and high-voltage trailing cables shall be handled only by persons wearing protective rubber gloves (see § 77.606-1) and, with such other protective devices as may be necessary and appropriate under the circumstances.

§ 77.606-1 Rubber gloves; minimum requirements.

(a) Rubber gloves (lineman's gloves) worn while handling high-voltage trailing cables shall be rated at least 20,000 volts and shall be used and tested in accordance with the provisions of §§ 77.704-6 through 77.704-8.

(b) Rubber gloves (wireman's gloves) worn while handling trailing cables energized by 660 to 1,000 volts shall be rated at least 1,000 volts and shall not be worn inside out or without protective leather gloves.

(c) Rubber gloves shall be inspected for defects before use on each shift and at least once thereafter during the shift when such rubber gloves are used for extended periods. All protective rubber gloves which contain defects shall be discarded and replaced prior to handling energized cables.

Subpart H—Grounding**§ 77.700 Grounding metallic sheaths, armors, and conduits enclosing power conductors.**

Metallic sheaths, armors, and conduits enclosing power conductors shall be electrically continuous throughout and shall be grounded by methods approved by an authorized representative of the Secretary.

§ 77.700-1 Approved methods of grounding.

Metallic sheaths, armors, and conduits in resistance grounded systems, where the enclosed conductors are a part of the system, will be approved if a solid connection is made to the neutral conductor; in all other systems, the following methods of grounding will be approved:

(a) A solid connection to metal waterlines having low resistance to earth;

(b) A solid connection to a grounding conductor, other than the neutral conductor of a resistance grounded system, extending to a low-resistance ground field;

(c) Any other method of grounding, approved by an authorized representative of the Secretary, which ensures that there is no difference in potential between such metallic enclosures and the earth.

§ 77.701 Grounding metallic frames, casings, and other enclosures of electric equipment.

Metallic frames, casings, and other enclosures of electric equipment that can become "alive" through failure of insulation or by contact with energized parts shall be grounded by methods approved by an authorized representative of the Secretary.

§ 77.701-1 Approved methods of grounding of equipment receiving power from ungrounded alternating current power systems.

For purposes of grounding metallic frames, casings and other enclosures of equipment receiving power from ungrounded alternating current power systems, the following methods of grounding will be approved:

(a) A solid connection between the metallic frame; casing, or other metal enclosure and the grounded metallic sheath, armor, or conduit enclosing the power conductor feeding the electric equipment enclosed;

(b) A solid connection to metal waterlines having low resistance to earth;

(c) A solid connection to a grounding conductor extending to a low-resistance ground field; and,

(d) Any other method of grounding, approved by an authorized representative of the Secretary, which insures that there is no difference in potential between such metal enclosures and the earth.

§ 77.701-2 Approved methods of grounding metallic frames, casings, and other enclosures of electric equipment receiving power from a direct-current power system.

(a) The following methods of grounding metallic frames, casings, and other enclosures of electric equipment receiving power from a direct-current power system with one polarity grounded will be approved:

(1) A solid connection to the grounded power conductor of the system; and,

(2) Any other method, approved by an authorized representative of the Secretary, which insures that there is no difference in potential between such metal enclosures and the earth.

(b) A method of grounding of metallic frames, casings, and other enclosures of electric equipment receiving power from a direct-current power system other than a system with one polarity grounded, will be approved by an authorized representative of the Secretary if the method insures that there is no difference in potential between such frames, casings, and other enclosures, and the earth.

§ 77.701-3 Grounding wires; capacity.

Where grounding wires are used to ground metallic sheaths, armors, conduits, frames, casings, and other metallic enclosures, such grounding wires will be approved if:

(a) Where the power conductor used is No. 6 A.W.G., or larger, the cross-sectional area of the grounding wire is at least one-half the cross-sectional area of the power conductor.

(b) Where the power conductor used is less than No. 6 A.W.G., the cross-sectional area of the grounding wire is equal to the cross-sectional area of the power conductor.

§ 77.701-4 Use of grounding connectors.

If ground wires are attached to grounded power conductors, separate clamps, suitable for such purpose, shall be used and installed to provide a solid connection.

§ 77.702 Protection other than grounding.

Methods other than grounding which provide no less effective protection may be permitted by the Secretary or his authorized representative. Such methods may not be used unless so approved.

§ 77.703 Grounding frames of stationary high-voltage equipment receiving power from ungrounded delta systems.

The frames of all stationary high-voltage equipment receiving power from ungrounded delta systems shall be grounded by methods approved by an authorized representative of the Secretary.

§ 77.703-1 Approved methods of grounding.

The methods of grounding stated in § 77.701-1 will be approved with respect to the grounding of frames of high-voltage equipment referred to in § 77.703.

§ 77.704 Work on high-voltage lines; deenergizing and grounding.

High-voltage lines shall be deenergized and grounded before work is performed on them, except that repairs may be permitted on energized high-voltage lines if (a) such repairs are made by a qualified person in accordance with procedures and safeguards set forth in §§ 77.704-1 through 77.704-11 of this Subpart H as applicable, and (b) the operator has tested and properly maintained the protective devices necessary in making such repairs.

§ 77.704-1 Work on high-voltage lines.

(a) No high-voltage line shall be regarded as deenergized for the purpose of performing work on it, until it has been determined by a qualified person (as provided in § 77.103) that such high-voltage line has been deenergized and grounded. Such qualified person shall by visual observation (1) determine that the disconnecting devices on the high-voltage circuit are in open position, and (2) insure that each ungrounded conductor of the high-voltage circuit upon which work is to be done is properly connected to the system grounding medium. In the case of resistance grounded or solid wye-connected systems, the neutral wire is the system grounding medium. In the case of an ungrounded power system,

either the steel armor or conduit enclosing the system or a surface grounding field is a system grounding medium;

(b) No work shall be performed on any high-voltage line which is supported by any pole or structure which also supports other high-voltage lines until: (1) All lines supported on the pole or structure are deenergized and grounded in accordance with all of the provisions of this § 77.704-1 which apply to the repair of deenergized surface high-voltage lines; or (2) the provisions of §§ 77.704-2 through 77.704-10 have been complied with, with respect to all energized lines, which are supported on the pole or structure.

(c) Work may be performed on energized surface high-voltage lines only in accordance with the provisions of §§ 77.704-2 through 77.704-10, inclusive.

§ 77.704-2 Repairs to energized high-voltage lines.

An energized high-voltage line may be repaired only when:

(a) The operator has determined that:

- (1) Such repairs cannot be scheduled during a period when the power circuit could be properly deenergized and grounded;
- (2) Such repairs will be performed on power circuits with a phase-to-phase nominal voltage no greater than 15,000 volts;
- (3) Such repairs on circuits with a phase-to-phase nominal voltage of 5,000 volts or more will be performed only with the use of live line tools; and,
- (4) Weather conditions will not interfere with such repairs or expose those persons assigned to such work to an imminent danger; and,

(b) The operator has designated a person qualified under the provisions of § 77.104 as the person responsible for carrying out such repairs and such person, in order to ensure protection for himself and other qualified persons assigned to perform such repairs from the hazards of such repair, has prepared and filed with the operator:

- (1) A general description of the nature and location of the damage or defect to be repaired;
- (2) The general plan to be followed in making such repairs;
- (3) A statement that a briefing of all qualified persons assigned to make such repairs was conducted informing them of the general plan, their individual assignments, and the dangers inherent in such assignments;
- (4) A list of the proper protective equipment and clothing that will be provided; and
- (5) Such other information as the person designated by the operator feels necessary to describe properly the means or methods to be employed in such repairs.

§ 77.704-3 Work on energized high-voltage surface lines; reporting.

Any operator designating and assigning qualified persons to perform repairs on energized high-voltage surface lines under the provisions of § 77.704-2 shall

maintain a record of such repairs. Such record shall contain a notation of the time, date, location, and general nature of the repairs made together with a copy of the information filed with the operator by the qualified person designated as responsible for performing such repairs.

§ 77.704-4 Simultaneous repairs.

When two or more persons are working on an energized high-voltage surface line simultaneously, and any one of them is within reach of another, such persons shall not be allowed to work on different phases or on equipment with different potentials.

§ 77.704-5 Installation of protective equipment.

Before repair work on energized high-voltage surface lines is begun, protective equipment shall be used to cover all bare conductors, ground wires, guys, telephone lines, and other attachments in proximity to the area of planned repairs. Such protective equipment shall be installed from a safe position below the conductors or other apparatus being covered. Each rubber protective device employed in the making of repairs shall have a dielectric strength of 20,000 volts, or more.

§ 77.704-6 Protective clothing; use and inspection.

All persons performing work on energized high-voltage surface lines shall wear protective rubber lineman's gloves, sleeves, and climber guards if climbers are worn. Protective rubber gloves shall not be worn wrong side out or without protective leather gloves. Protective devices worn by a person assigned to perform repairs on high-voltage surface lines shall be worn continuously from the time he leaves the ground until he returns to the ground and, if such devices are employed for extended periods, such person shall visually inspect the equipment assigned him for defects before each use and, in no case, less than twice each day.

§ 77.704-7 Protective equipment; inspection.

Each person shall visually inspect protective equipment and clothing provided him in connection with work on high-voltage surface lines before using such equipment and clothing, and any equipment or clothing containing any defect or damage shall be discarded and replaced with proper protective equipment or clothing prior to the performance of any electrical work on such lines.

§ 77.704-8 Protective equipment; testing and storage.

(a) All rubber protective equipment used on work on energized high-voltage surface lines shall be electrically tested by the operator in accordance with ASTM standards, Part 28, published February 1968, and such testing shall be conducted in accordance with the following schedule:

- (1) Rubber gloves, once each month;
- (2) Rubber sleeves, once every 3 months;

(3) Rubber blankets, once every 6 months;

(4) Insulator hoods and line hose, once a year; and

(5) Other electric protective equipment, once a year.

(b) Rubber gloves shall not be stored wrong side out. Blankets shall be rolled when not in use, and line hose, and insulator hoods shall be stored in their natural position and shape.

§ 77.704-9 Operating disconnecting or cutout switches.

Disconnecting or cutout switches on energized high-voltage surface lines shall be operated only with insulated sticks, fuse tongs, or pullers which are adequately insulated and maintained to protect the operator from the voltage to which he is exposed. When such switches are operated from the ground, the person using such devices shall wear protective rubber lineman's gloves, except where such switches are bonded to a metal mat as provided in § 77.513.

§ 77.704-10 Tying into energized high-voltage surface circuits.

If the work of forming an additional circuit by tying into an energized high-voltage surface line is performed from the ground, any person performing such work must wear and employ all of the protective equipment and clothing required under the provisions of §§ 77.704-5 and 77.704-6. In addition, the insulated stick used by such person must have been designed for such purpose and must be adequately insulated and be maintained to protect such person from the voltage to which he is exposed.

§ 77.704-11 Use of grounded messenger wires; ungrounded systems.

Solely for purposes of grounding ungrounded high-voltage power systems, grounded messenger wires used to suspend the cables of such systems may be used as a grounding medium.

§ 77.705 Guy wires; grounding.

Guy wires from poles supporting high-voltage transmission lines shall be securely connected to the system ground or be provided with insulators installed near the pole end.

Subpart I—Surface High-Voltage Distribution

§ 77.800 High-voltage circuits; circuit breakers.

High-voltage circuits supplying power to portable or mobile equipment shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained and equipped with devices to provide protection against under voltage, grounded phase, short circuit and overcurrent. High-voltage circuits supplying power to stationary equipment shall be protected against overloads by either a circuit breaker or fuses of the correct type and capacity.

§ 77.800-1 Testing, examination, and maintenance of circuit breakers; procedures.

(a) Circuit breakers and their auxiliary devices protecting high-voltage circuits to portable or mobile equipment shall be tested and examined at least once each month by a person qualified as provided in § 77.103.

(b) Tests shall include:

(1) Breaking continuity of the ground check conductor where ground check monitoring is used; and,

(2) Actuating any of the auxiliary protective relays.

(c) Examination shall include visual observation of all components of the circuit breaker and its auxiliary devices, and such repairs or adjustments as are indicated by such tests and examinations shall be carried out immediately.

§ 77.800-2 Testing, examination, and maintenance of circuit breakers; record.

The operator shall maintain a written record of each test, examination, repair, or adjustment of all circuit breakers protecting high-voltage circuits. Such record shall be kept in a book approved by the Secretary.

§ 77.801 Grounding resistors.

The grounding resistor, where required, shall be of the proper ohmic value to limit the voltage drop in the grounding circuit external to the resistor to not more than 100 volts under fault conditions. The grounding resistor shall be rated for maximum fault current continuously and insulated from ground for a voltage equal to the phase-to-phase voltage of the system.

§ 77.801-1 Grounding resistors; continuous current rating.

The ground fault current rating of grounding resistors shall meet the "extended time rating" set forth in American Institute of Electrical Engineers, Standard No. 32.

§ 77.802 Protection of high-voltage circuits; neutral grounding resistors; disconnecting devices.

High-voltage circuits supplying portable or mobile equipment shall contain either a direct or derived neutral which shall be grounded through a suitable resistor at the source transformers, and a grounding circuit, originating at the grounded side of the grounding resistor, shall extend along with the power conductors and serve as a grounding conductor for the frames of all high-voltage equipment supplied power from that circuit, except that the Secretary or his authorized representative may permit other high-voltage circuits to feed stationary electrical equipment, if, he finds that such exception will not pose a hazard to the miners. Disconnecting devices shall be installed and so equipped or designed in such a manner that it can be determined by visual observation that the power is disconnected.

§ 77.803 Fail safe ground check circuits on high-voltage resistance grounded systems.

On and after September 30, 1971, all high-voltage, resistance grounded systems shall include a fail safe ground check circuit or other no less effective device approved by the Secretary to monitor continuously the grounding circuit to assure continuity. The fail safe ground check circuit shall cause the circuit breaker to open when either the ground or ground check wire is broken.

§ 77.803-1 Fail safe ground check circuits; maximum voltage.

The maximum voltage used for ground check circuits under § 77.803 shall not exceed 96 volts.

§ 77.803-2 Ground check systems not employing pilot check wires; approval by the Secretary.

Ground check systems not employing pilot check wires shall be approved by the Secretary only if it is determined that the system includes a fail safe design which will cause the circuit interrupter to open when ground continuity is broken.

§ 77.804 High-voltage trailing cables; minimum design requirements.

(a) High-voltage trailing cables used in resistance grounded systems shall be equipped with metallic shields around each power conductor with one or more ground conductors having a total cross-sectional area of not less than one-half the power conductor, and with an insulated conductor for the ground continuity check circuit. External ground check conductors may be used if they are not smaller than No. 8 (AWG) and have an insulation rated at least 600 volts.

(b) All such high-voltage trailing cables shall be adequate for the intended current and voltage. Splices made in such cables shall provide continuity of all components.

§ 77.805 Cable couplers and connection boxes; minimum design requirements.

(a) (1) Couplers that are used in medium- or high-voltage power circuits shall be of the three-phase type and enclosed in a full metallic shell, except that the Secretary may permit, under such guidelines as he may prescribe, no less effective couplers constructed of materials other than metal.

(2) Cable couplers shall be adequate for the intended current and voltage.

(3) Cable couplers with any metal exposed shall be grounded to the ground conductor in the cable.

(4) Couplers shall be constructed to cause the ground check continuity conductor to break first and the ground conductor last when being uncoupled when pilot check circuits are used.

(b) Cable connection boxes shall be of substantial construction and designed to guard all energized parts from personal contact.

§ 77.806 Connection of single-phase loads.

Single-phase loads, such as transformer primaries, shall be connected phase to phase in resistance grounded systems.

§ 77.807 Installation of high-voltage transmission cables.

High-voltage transmission cables shall be installed or placed so as to afford protection against damage. They shall be placed to prevent contact with low-voltage or communication circuits.

§ 77.807-1 High-voltage powerlines; clearances above ground.

High-voltage powerlines located above driveways, haulageways, and railroad tracks shall be installed to provide the minimum vertical clearance specified in National Electrical Safety Code: *Provided, however*, That in no event shall any high-voltage powerline be installed less than 15 feet above ground.

§ 77.807-2 Booms and masts; minimum distance from high-voltage lines.

The booms and masts of equipment operated on the surface of any coal mine shall not be operated within 10 feet of an energized overhead powerline. Where the voltage of overhead powerlines is 69,000 volts, or more, the minimum distance from the boom or mast shall be as follows:

Nominal power line voltage (in 1,000 volts)	Minimum distance (feet)
69-114	12
115-229	15
230-344	20
345-499	25
500 or more	35

§ 77.807-3 Movement of equipment; minimum distance from high-voltage lines.

When any part of any equipment operated on the surface of any coal mine is required to pass under or by any energized high-voltage powerline and the clearance between such equipment and powerline is less than that specified in § 77.807-2 for booms and masts, such powerlines shall be deenergized or other precautions shall be taken.

§ 77.808 Disconnecting devices.

Disconnecting devices shall be installed at the beginning of each branch line in high-voltage circuits and they shall be equipped or designed in such a manner that it can be determined by visual observation that the circuit is deenergized when such devices are open.

§ 77.809 Identification of circuit breakers and disconnecting switches.

Circuit breakers and disconnecting switches shall be labeled to show which units they control, unless identification can be made readily by location.

§ 77.810 High-voltage equipment; grounding.

Frames, supporting structures, and enclosures of stationary, portable, or

mobile high-voltage equipment shall be effectively grounded.

§ 77.811 Movement of portable substations and transformers.

Portable substations and transformers shall be deenergized before they are moved from one location to another.

Subpart J—Low- and Medium-Voltage Alternating Current Circuits

§ 77.900 Low- and medium-voltage circuits serving portable or mobile three-phase alternating current equipment; circuit breakers.

Low- and medium-voltage circuits supplying power to portable or mobile three-phase alternating current equipment shall be protected by suitable circuit breakers of adequate interrupting capacity which are properly tested and maintained and equipped with devices to provide protection against undervoltage, grounded phase, short circuit, and overcurrent.

§ 77.900-1 Testing, examination, and maintenance of circuit breakers; procedures.

Circuit breakers protecting low- and medium-voltage circuits serving portable or mobile three-phase alternating current equipment and their auxiliary devices shall be tested and examined at least once each month by a person qualified as provided in § 77.103. In performing such tests, the circuit breaker auxiliaries or control circuits shall be actuated in any manner which causes the circuit breaker to open. All components of the circuit breaker and its auxiliary devices shall be visually examined and such repairs or adjustments as are indicated by such tests and examinations shall be carried out immediately.

§ 77.900-2 Testing, examination, and maintenance of circuit breakers; record.

The operator shall maintain a written record of each test, examination, repair or adjustment of all circuit breakers protecting low- and medium-voltage circuits serving three-phase alternating current equipment and such record shall be kept in a book approved by the Secretary.

§ 77.901 Protection of low- and medium-voltage three-phase circuits.

(a) Low- and medium-voltage circuits supplying power to portable or mobile three-phase alternating equipment shall contain:

(1) Either a direct or derived neutral grounded through a suitable resistor at the power source;

(2) A grounding circuit originating at the grounded side of the grounding resistor which extends along with the power conductors and serves as a grounding conductor for the frames of all the electric equipment supplied power from the circuit.

(b) Grounding resistors, where required, shall be of an ohmic value which limits the ground fault current to no more than 25 amperes. Such grounding resistors shall be rated for maximum

fault current continuously and provide insulation from ground for a voltage equal to the phase-to-phase voltage of the system.

(c) Low- and medium-voltage circuits supplying power to three-phase alternating current stationary electric equipment shall comply with the National Electric Code.

§ 77.901-1 Grounding resistor; continuous current rating.

The ground fault current rating of grounding resistors shall meet the "extended time rating" set forth in American Institute of Electrical Engineers Standard No. 32.

§ 77.902 Low- and medium-voltage ground check monitor circuits.

On and after September 30, 1971, three-phase low- and medium-voltage resistance grounded systems to portable and mobile equipment shall include a fail safe ground check circuit or other no less effective device approved by the Secretary to monitor continuously the grounding circuit to assure continuity. The fail safe ground check circuit shall cause the circuit breaker to open when either the ground or pilot check wire is broken. Cable couplers shall be constructed to cause the ground check continuity conductor to break first and the ground conductor last when being uncoupled when pilot check circuits are used.

§ 77.902-1 Fail safe ground check circuits; maximum voltage.

The maximum voltage used for ground check circuits under § 77.902 shall not exceed 40 volts.

§ 77.902-2 Approved ground check systems not employing pilot check wires.

Ground check systems not employing pilot check wires shall be approved by the Secretary only after it has been determined that the system includes a fail safe design causing the circuit breaker to open when ground continuity is broken.

§ 77.902-3 Attachment of ground conductors and ground check wires to equipment frames; use of separate connections.

In grounding the frames of stationary, portable, or mobile equipment receiving power from resistance grounded systems, separate connections shall be used.

§ 77.903 Disconnecting devices.

Disconnecting devices shall be installed in circuits supplying power to portable or mobile equipment and shall provide visual evidence that the power is disconnected.

§ 77.904 Identification of circuit breakers.

Circuit breakers shall be labeled to show which circuits they control unless identification can be made readily by location.

§ 77.905 Connection of single-phase loads.

Single-phase loads shall be connected phase-to-phase in resistance grounded systems.

§ 77.906 Trailing cables supplying power to low-voltage mobile equipment; ground wires and ground check wires.

On and after September 30, 1971, all trailing cables supplying power to portable or mobile equipment from low-voltage three-phase resistance grounded power systems shall contain one or more ground conductors having a cross-sectional area of not less than one-half the power conductor. Such trailing cables shall include an insulated conductor for the ground continuity check circuit except where a no less effective device has been approved by the Secretary to assure continuity. Splices made in low-voltage trailing cables shall provide continuity of all components.

Subpart K—Ground Control

§ 77.1000 Highwalls, pits and spoil banks; plans.

Each operator shall establish and follow a ground control plan for the safe control of all highwalls, pits and spoil banks to be developed after June 30, 1971, which shall be consistent with prudent engineering design and will insure safe working conditions. The mining methods employed by the operator shall be selected to insure highwall and spoil bank stability.

§ 77.1000-1 Filing of plan.

The operator shall file a copy of such plan, and revisions thereof, with the Coal Mine Health and Safety District of Subdistrict office for the District or Subdistrict in which the mine is located, and shall identify the name and location of the mine; the Bureau of Mines identification number if known; and the name and address of the mine operator.

§ 77.1001 Stripping; loose material.

Loose hazardous material shall be stripped for a safe distance from the top of pit or highwalls, and the loose unconsolidated material shall be sloped to the angle of repose, or barriers, baffle boards, screens, or other devices be provided that afford equivalent protection.

§ 77.1002 Box cuts; spoil material placement.

When box cuts are made, necessary precautions shall be taken to minimize the possibility of spoil material rolling into the pit.

§ 77.1003 Benches.

To insure safe operation, the width and height of benches shall be governed by the type of equipment to be used and the operation to be performed.

§ 77.1004 Ground control; inspection and maintenance; general.

(a) Highwalls, banks, benches, and terrain sloping into the working areas shall be examined after every rain, freeze, or thaw before men work in such areas, and such examination shall be made and recorded in accordance with § 77.1713.

(b) Overhanging highwalls and banks shall be taken down and other unsafe ground conditions shall be corrected promptly, or the area shall be posted.

§ 77.1005 Scaling highwalls; general.

(a) Hazardous areas shall be scaled before any other work is performed in the hazardous area. When scaling of highwalls is necessary to correct conditions that are hazardous to persons in the area, a safe means shall be provided for performing such work.

(b) Whenever it becomes necessary for safety to remove hazardous material from highwalls by hand, the hazardous material shall be approached from a safe direction and the material removed from a safe location.

§ 77.1006 Highwalls; men working.

(a) Men, other than those necessary to correct unsafe conditions, shall not work near or under dangerous highwalls or banks.

(b) Except as provided in paragraph (c) of this section, men shall not work between equipment and the highwall or spoil bank where the equipment may hinder escape from falls or slides.

(c) Special safety precautions shall be taken when men are required to perform repair work between immobilized equipment and the highwall or spoil bank and such equipment may hinder escape from falls or slides.

§ 77.1007 Drilling; general.

(a) Equipment that is to be used during a shift shall be inspected each shift by a competent person. Equipment defects affecting safety shall be reported.

(b) Equipment defects affecting safety shall be corrected before the equipment is used.

§ 77.1008 Relocation of drills; safeguards.

(a) When a drill is being moved from one drilling area to another, drill steel, tools, and other equipment shall be secured and the mast placed in a safe position.

(b) When a drill helper is used his location shall be made known to the operator at all times when the drill is being moved.

§ 77.1009 Drill; operation.

(a) While in operation drills shall be attended at all times.

(b) Men shall not drill from positions that hinder their access to the control levers, or from insecure footing or staging, or from atop equipment not designed for this purpose.

(c) Men shall not be on a mast while the drill bit is in operation unless a safe platform is provided and safety belts are used.

(d) Drill crews and others shall stay clear of augers or drill stems that are in motion. Persons shall not pass under or step over a moving stem or auger.

(e) In the event of power failure, drill controls shall be placed in the neutral position until power is restored.

(f) When churn drills or vertical rotary drills are used, drillers shall not be permitted to work under suspended tools, and when collaring holes, inspecting, or during any operation in which tools are removed from the hole, all tools shall be lowered to the ground or platform.

§ 77.1010 Collaring holes.

(a) Starter steels shall be used when collaring holes with hand-held drills.

(b) Men shall not hold the drill steel while collaring holes, or rest their hands on the chuck or centralizer while drilling.

§ 77.1011 Drill holes; guarding.

Drill holes large enough to constitute a hazard shall be covered or guarded.

§ 77.1012 Jackhammers; operation; safeguards.

Men operating or working near jackhammers or jackleg drills, or other drilling machines shall position themselves so that they will not be struck or lose their balance if the drill steel breaks or sticks.

§ 77.1013 Air drills; safeguards.

Air shall be turned off and bled from the air hoses before hand-held air drills are moved from one working area to another.

Subpart L—Fire Protection**§ 77.1100 Fire protection; training and organization.**

Firefighting facilities and equipment shall be provided commensurate with the potential fire hazards at each structure, enclosure and other facility (including custom coal preparation) at the mine and the employees at such facilities shall be instructed and trained annually in the use of such firefighting facilities and equipment.

§ 77.1101 Escape and evacuation; plan.

(a) Before June 30, 1971, each operator of a mine shall establish and keep current a specific escape and evacuation plan to be followed in the event of a fire.

(b) All employees shall be instructed on current escape and evacuation plans, fire alarm signals, and applicable procedures to be followed in case of fire.

(c) Plans for escape and evacuation shall include the designation and proper maintenance of adequate means for exit from all areas where persons are required to work or travel including buildings and equipment and in areas where persons normally congregate during the work shift.

§ 77.1102 Warning signs; smoking and open flame.

Signs warning against smoking and open flames shall be posted so they can be readily seen in areas or places where fire or explosion hazards exist.

§ 77.1103 Flammable liquids; storage.

(a) Flammable liquids shall be stored in accordance with standards of the National Fire Protection Association. Small quantities of flammable liquids drawn from storage shall be kept in properly identified safety cans.

(b) Unburied flammable-liquid storage tanks shall be mounted securely on firm foundations. Outlet piping shall be provided with flexible connections or other special fittings to prevent adverse effects from tank settling.

(c) Fuel lines shall be equipped with valves to cut off fuel at the source and shall be located and maintained to minimize fire hazards.

(d) Areas surrounding flammable-liquid storage tanks and electric substations and transformers shall be kept free from grass (dry), weeds, underbrush, and other combustible materials such as trash, rubbish, leaves and paper, for at least 25 feet in all directions.

§ 77.1104 Accumulations of combustible materials.

Combustible materials, grease, lubricants, paints, or flammable liquids shall not be allowed to accumulate where they can create a fire hazard.

§ 77.1105 Internal combustion engines; fueling.

Internal combustion engines, except diesels, shall be shut off and stopped before being fueled.

§ 77.1106 Battery-charging stations; ventilation.

Battery-charging stations shall be located in well-ventilated areas. Battery-charging stations shall be equipped with reverse current protection where such stations are connected directly to direct current power systems.

§ 77.1107 Belt conveyors.

Belt conveyors in locations where fire would create a hazard to personnel shall be provided with switches to stop the drive pulley automatically in the event of excessive slippage.

§ 77.1108 Firefighting equipment; requirements; general.

On and after June 30, 1971, each operator of a coal mine shall provide an adequate supply of firefighting equipment which is adapted to the size and suitable for use under the conditions present on the surface at the mine.

§ 77.1108-1 Type and capacity of firefighting equipment.

Firefighting equipment required under this § 77.1108 shall meet the following minimum requirements:

(a) **Waterlines.** Waterlines shall be capable of delivering 50 gallons of water a minute at a nozzle pressure of 50 pounds per square inch. Where storage tanks are used as a source of water supply, the tanks shall be of 1,000-gallon capacity for each 1,000 tons of coal processed (average) per shift.

(b) **Fire extinguishers.** Fire extinguishers shall be:

(1) Of the appropriate type for the particular fire hazard involved;

(2) Adequate in number and size for the particular fire hazard involved;

(3) Replaced immediately with fully charged extinguishers after any discharge is made from an extinguisher; and

(4) Approved by the Underwriter's Laboratories, Inc., or the Factory Mutual Research Corp., or other competent testing agency acceptable to the Bureau of Mines.

(c) **Fire hose.** Fire hose and couplings shall meet the requirements of the

Underwriter's Laboratories, Inc., or Factory Mutual Research Corp.'s specifications. Cotton or cotton-polyester jacketed hose shall be treated in accordance with the U.S. Department of Agriculture Forest Service Specification 182 for mildew resistance. The water pressure at the hose nozzle shall not be excessively high so as to present a hazard to the nozzle operator.

§ 77.1109 Quantity and location of firefighting equipment.

Preparation plants, dryer plants, tip-ple, drawoff tunnels, shops, and other surface installations shall be equipped with the following firefighting equipment:

(a) Each structure presenting a fire hazard shall be provided with portable fire extinguishers commensurate with the potential fire hazard at the structure in accordance with the recommendations of the National Fire Protection Association.

(b) Preparation plants shall be equipped with waterlines, with outlet valves on each floor, and with sufficient fire hose to project a water stream to any point in the plant. However, where freezing conditions exist or water is not available, a 125-pound multipurpose dry powder extinguisher may be substituted for the purposes of this paragraph (b) for each 2,500 square feet of floor space in a wooden or other flammable structure, or for each 5,000 square feet of floor space in a metal, concrete-block, or other type of non-flammable construction.

(c) (1) Mobile equipment, including trucks, front-end loaders, bulldozers, portable welding units, and augers, shall be equipped with at least one portable fire extinguisher.

(2) Power shovels, draglines, and other large equipment shall be equipped with at least one portable fire extinguisher; however, additional fire extinguishers may be required by an authorized representative of the Secretary.

(3) Auxiliary equipment such as portable drills, sweepers, and scrapers, when operated more than 600 feet from equipment required to have portable fire extinguishers, shall be equipped with at least one fire extinguisher.

(d) Fire extinguishers shall be provided at permanent electrical installations commensurate with the potential fire hazard at such installation in accordance with the recommendations of the National Fire Protection Association.

(e) Two portable fire extinguishers, or the equivalent, shall be provided at each of the following combustible liquid storage installations:

(1) Near each above ground or unburied combustible liquid storage station; and,

(2) Near the transfer pump of each buried combustible liquid storage tank.

(f) Vehicles transporting explosives and blasting agents shall be equipped with fire protection as recommended in Code 495, section 20, National Fire Protection Association Handbook, 12th Edition, 1962.

§ 77.1110 Examination and maintenance of firefighting equipment.

Firefighting equipment shall be continuously maintained in a usable and operative condition. Fire extinguishers shall be examined at least once every 6 months and the date of such examination shall be recorded on a permanent tag attached to the extinguisher.

§ 77.1111 Welding, cutting, soldering; use of fire extinguisher.

One portable fire extinguisher shall be provided at each location where welding, cutting, or soldering with arc or flame is performed.

§ 77.1112 Welding, cutting, or soldering with arc or flame; safeguards.

(a) When welding, cutting, or soldering with arc or flame near combustible materials, suitable precautions shall be taken to insure that smoldering metal or sparks do not result in a fire.

(b) Before welding, cutting, or soldering is performed in areas likely to contain methane, an examination for methane shall be made by a qualified person with a device approved by the Secretary for detecting methane. Examinations for methane shall be made immediately before and periodically during welding, cutting, or soldering and such work shall not be permitted to commence or continue in air which contains 1.0 volume per centum or more of methane.

Subpart M—Maps

§ 77.1200 Mine map.

The operator shall maintain an accurate and up-to-date map of the mine, on a scale of not less than 100 nor more than 500 feet to the inch, at or near the mine, in an area chosen by the mine operator, with a duplicate copy on file at a separate and distinct location, to minimize the danger of destruction by fire or other hazard. The map shall show:

(a) Name and address of the mine;

(b) The property or boundary lines of the active areas of the mine;

(c) Contour lines passing through whole number elevations of the coalbed being mined. The spacing of such lines shall not exceed 25-foot elevation levels, except that a broader spacing of contour lines may be approved by the District Manager for steeply pitching coalbeds. Contour lines may be placed on overlays or tracings attached to mine maps.

(d) The general elevation of the coalbed or coalbeds being mined, and the general elevation of the surface;

(e) Either producing or abandoned oil and gas wells located on the mine property;

(f) The location and elevation of any body of water dammed or held back in any portion of the mine: *Provided, however,* Such bodies of water may be shown on overlays or tracings attached to the mine maps;

(g) All prospect drill holes that penetrate the coalbed or coalbeds being mined on the mine property;

(h) All auger and strip mined areas of the coalbed or coalbeds being mined

on the mine property together with the line of maximum depth of holes drilled during auger mining operations.

(i) All worked out and abandoned areas;

(j) The location of railroad tracks and public highways leading to the mine, and mine buildings of a permanent nature with identifying names shown;

(k) Underground mine workings underlying and within 1,000 feet of the active areas of the mine;

(l) The location and description of at least two permanent base line points, and the location and description of at least two permanent elevation bench marks used in connection with establishing or referencing mine elevation surveys; and,

(m) The scale of the map.

§ 77.1201 Certification of mine maps.

Mine maps shall be made or certified by an engineer or surveyor registered by the State in which the mine is located.

§ 77.1202 Availability of mine map.

The mine map maintained in accordance with the provisions of § 77.1200 shall be available for inspection by the Secretary or his authorized representative.

Subpart N—Explosives and Blasting

§ 77.1300 Explosives and blasting.

(a) No explosives, blasting agent, detonator, or any other related blasting device or material shall be stored, transported, carried, handled, charged, fired, destroyed, or otherwise used, employed or disposed of by any person at a coal mine except in accordance with the provisions of §§ 77.1301 through 77.1304, inclusive.

(b) The term "explosives" as used in this Subpart N includes blasting agents. The standards in this Subpart N in which the term "explosives" appears are applicable to blasting agents (as well as to other explosives) unless blasting agents are expressly excluded.

§ 77.1301 Explosives; magazines.

(a) Detonators and explosives other than blasting agents shall be stored in magazines.

(b) Detonators shall not be stored in the same magazine with explosives.

(c) Magazines other than box type shall be:

(1) Located in accordance with the current American Table of Distances for storage of explosives.

(2) Detached structures located away from powerlines, fuel storage areas, and other possible sources of fire.

(3) Constructed substantially of non-combustible material or covered with fire-resistant material.

(4) Reasonably bullet resistant.

(5) Electrically bonded and grounded if constructed of metal.

(6) Made of nonsparking materials on the inside, including floors.

(7) Provided with adequate and effectively screened ventilation openings near the floor and ceiling.

(8) Kept locked securely when unattended.

(9) Posted with suitable danger signs so located that a bullet passing through the face of a sign will not strike the magazine.

(10) Used exclusively for storage of explosives or detonators and kept free of all extraneous materials.

(11) Kept clean and dry in the interior, and in good repair.

(12) Unheated, unless heated in a manner that does not create a fire or explosion hazard.

(d) Box-type magazines used to store explosives or detonators in work areas shall be constructed with only nonsparking material inside and equipped with covers or doors and shall be located out of the line of blasts.

(e) Secondary and box-type magazines shall be suitably labeled.

(f) Detonator-storage magazines shall be separated by at least 25 feet from explosive-storage magazines.

(g) Cases or boxes containing explosives shall not be stored in magazines on their ends or sides nor stacked more than 6 feet high.

(h) Ammonium nitrate-fuel oil blasting agents shall be physically separated from other explosives, safety fuse, or detonating cord stored in the same magazine and in such a manner that oil does not contaminate the other explosives, safety fuse, or detonating cord.

§ 77.1302 Vehicles used to transport explosives.

(a) Vehicles used to transport explosives, other than blasting agents, shall have substantially constructed bodies, no sparking metal exposed in the cargo space, and shall be equipped with suitable sides and tail gates; explosives shall not be piled higher than the side or end.

(b) Vehicles containing explosives or detonators shall be maintained in good condition and shall be operated at a safe speed and in accordance with all safe operating practices.

(c) Vehicles containing explosives or detonators shall be posted with proper warning signs.

(d) Other materials or supplies shall not be placed on or in the cargo space of a conveyance containing explosives, detonating cord or detonators, except for safety fuse and except for properly secured nonsparking equipment used expressly in the handling of such explosives, detonating cord or detonators.

(e) Explosives and detonators shall be transported in separate vehicles unless separated by 4 inches of hardwood or the equivalent.

(f) Explosives or detonators shall be transported promptly without undue delays in transit.

(g) Explosives or detonators shall be transported at times and over routes that expose a minimum number of persons.

(h) Only the necessary attendants shall ride on or in vehicles containing explosives or detonators.

(i) Vehicles shall be attended, whenever practical and possible, while loaded with explosives or detonators.

(j) When vehicles containing explosives or detonators are parked, the brakes shall be set, the motive power shut off, and the vehicles shall be blocked securely against rolling.

(k) Vehicles containing explosives or detonators shall not be taken to a repair garage or shop for any purpose.

§ 77.1303 Explosives, handling and use.

(a) Persons who use or handle explosives or detonators shall be experienced men who understand the hazards involved; trainees shall do such work only under the supervision of and in the immediate presence of experienced men.

(b) Blasting operations shall be under the direct control of authorized persons.

(c) Substantial nonconductive closed containers shall be used to carry explosives, other than blasting agents to the blasting site.

(d) Damaged or deteriorated explosives or detonators shall be destroyed in a safe manner.

(e) Where electric blasting is to be performed, electric circuits to equipment in the immediate area to be blasted shall be deenergized before explosives or detonators are brought into the area; the power shall not be turned on again until after the shots are fired.

(f) Explosives shall be kept separated from detonators until charging is started.

(g) Areas in which charged holes are awaiting firing shall be guarded, or barricaded and posted, or flagged against unauthorized entry.

(h) Ample warning shall be given before blasts are fired. All persons shall be cleared and removed from the blasting area unless suitable blasting shelters are provided to protect men endangered by concussion or flyrock from blasting.

(i) Lead wires and blasting lines shall not be strung across power conductors, pipelines, railroad tracks, or within 20 feet of bare powerlines. They shall be protected from sources of static or other electrical contact.

(j) For the protection of underground workers, special precautions shall be taken when blasting in close proximity to underground operations, and no blasting shall be done that would be hazardous to persons working underground.

(k) Holes shall not be drilled where there is danger of intersecting a charged or misfired hole.

(l) Only wooden or other nonsparking implements shall be used to punch holes in an explosive cartridge.

(m) Tamping poles shall be blunt and squared at one end and made of wood, nonsparking material, or of special plastic acceptable to the Bureau of Mines.

(n) Delay connectors for firing detonating cord shall be treated and handled with the same safety precautions as blasting caps and electric detonators.

(o) Capped primers shall be made up at the time of charging and as close to the blasting site as conditions allow.

(p) A capped primer shall be prepared so that the detonator is contained securely and is completely embedded within the explosive cartridge.

(q) No tamping shall be done directly on a capped primer.

(r) Detonating cord shall not be used if it has been kinked, bent, or otherwise handled in such a manner that the train of detonation may be interrupted.

(s) Fuse shall not be used if it has been kinked, bent sharply, or handled roughly in such a manner that the train of deflagration may be interrupted.

(t) Blasting caps shall be crimped to fuses only with implements designed for that specific purpose.

(u) When firing from 1 to 15 blast-holes with safety fuse ignited individually using hand-held lighters, the fuses shall be of such lengths to provide the minimum burning time specified in the following table for a particular size round:

Number of holes in a round	Minimum burning time, minutes
1	2
2-5	2½
6-10	3½
11-15	5

In no case shall any 40-second-per-foot safety fuse less than 36 inches long or any 30-second-per-foot safety fuse less than 48 inches long be used.

(v) The burning rate of the safety fuse in use at any time shall be measured, posted in conspicuous locations, and brought to the attention of all men concerned with blasting.

(w) Electric detonators of different brands shall not be used in the same round.

(x) Adequate priming shall be employed to guard against misfires, increased toxic fumes, and poor performance.

(y) Except when being tested with a blasting galvanometer:

(1) Electric detonators shall be kept shunted until they are being connected to the blasting line or wired into a blasting round.

(2) Wired rounds shall be kept shunted until they are being connected to the blasting line.

(3) Blasting lines shall be kept shunted until immediately before blasting.

(z) Completely wired rounds shall be tested with a blasting galvanometer before connections are made to the blasting line.

(aa) Permanent blasting lines shall be properly supported, insulated, and kept in good repair.

(bb) At least a 5-foot airgap shall be provided between the blasting circuit and the power circuit.

(cc) When instantaneous blasting is performed, the double-trunkline or loop system shall be used in detonating-cord blasting.

(dd) When instantaneous blasting is performed, trunklines, in multiple-row blasts, shall make one or more complete loops, with crossties between loops at intervals of not over 200 feet.

(ee) All detonating cord knots shall be tight and all connections shall be kept at right angles to the trunklines.

(ff) Power sources shall be suitable for the number of electrical detonators to be fired and for the type of circuits used.

(gg) Electric circuits from the blasting switches to the blast area shall not be grounded.

(hh) Safety switches and blasting switches shall be labeled, encased in boxes, and arranged so that the covers of the boxes cannot be closed with the switches in the through-circuit or firing position.

(ii) Blasting switches shall be locked in the open position, except when closed to fire the blast. Lead wires shall not be connected to the blasting switch until the shot is ready to be fired.

(jj) The key or other control to an electrical firing device shall be entrusted only to the person designated to fire the round or rounds.

(kk) If branch circuits are used when blasts are fired from power circuits, safety switches located at safe distances from the blast areas shall be provided in addition to the main blasting switch.

(ll) Misfires shall be reported to the proper supervisor and shall be disposed of safely before any other work is performed in that blasting area.

(mm) When safety fuse has been used, men shall not return to misfired holes for at least 30 minutes.

(nn) When electric blasting caps have been used, men shall not return to misfired holes for at least 15 minutes.

(oo) If explosives are suspected of burning in a hole, all persons in the endangered area shall move to a safe location and no one should return to the hole until the danger has passed, but in no case within 1 hour.

(pp) Blasted areas shall be examined for undetonated explosives after each blast and undetonated explosives found shall be disposed of safely.

(qq) Blasted areas shall not be reentered by any person after firing until such time as concentrations of smoke, dust, or fumes have been reduced to safe limits.

(rr) In secondary blasting, if more than one shot is to be fired at one time, blasting shall be done electrically or with detonating cord.

(ss) Unused explosives and detonators shall be moved to a safe location as soon as charging operations are completed.

(tt) When electric detonators are used, charging shall be stopped immediately when the presence of static electricity or stray currents is detected; the condition shall be remedied before charging is resumed.

(uu) When electric detonators are used, charging shall be suspended and men withdrawn to a safe location upon the approach of an electrical storm.

§ 77.1304 Blasting agents; special provisions.

(a) Sensitized ammonium nitrate blasting agents, and the components

thereof prior to mixing, shall be mixed and stored in accordance with the recommendations in Bureau of Mines Information Circular 8179, "Safety Recommendations for Sensitized Ammonium Nitrate Blasting Agents," or subsequent revisions.

(b) Where pneumatic loading is employed, before any type of blasting operation using blasting agents is put into effect, an evaluation of the potential hazard of static electricity shall be made. Adequate steps, including the grounding and bonding of the conductive parts of pneumatic loading equipment, shall be taken to eliminate the hazard of static electricity before blasting agent use is commenced.

(c) Pneumatic loading equipment shall not be grounded to waterlines, air-lines, rails, or the permanent electrical grounding systems.

(d) Hoses used in connection with pneumatic loading machines shall be of the semiconductive type, having a total resistance low enough to permit the dissipation of static electricity and high enough to limit the flow of stray electric currents to a safe level. Wire-countered hose shall not be used because of the potential hazard from stray electric currents.

Subpart O—Man Hoisting

§ 77.1400 Man hoists and elevators.

The standards set forth in this Subpart O, apply only to hoists and elevators, together with their appurtenances, that are used for hoisting men.

§ 77.1401 Automatic controls and brakes.

Hoists and elevators shall be equipped with overspeed, overwind, and automatic stop controls and with brakes capable of stopping the elevator when fully loaded.

§ 77.1402 Rated capacity.

Hoists and elevators shall have rated capacities consistent with the loads handled and the recommended safety factors of the ropes and cables used.

§ 77.1402-1 Ropes and cables; specifications.

The American National Standards Institute "Specifications for the Use of Wire Ropes for Mines," M 11.1-1960, or the latest revision thereof, shall be used as a guide in the use, selection, installation, and maintenance of wire ropes used for hoisting.

§ 77.1402-2 Maximum load; posting.

The operator shall designate the maximum number of men permitted to ride on each hoist or elevator at one time; this limit shall be posted on each elevator and on each landing.

§ 77.1403 Inspection and maintenance.

(a) Hoists and elevators shall be examined daily and such examinations shall include, but not be limited to, the following:

(1) A visual examination of the rope for wear, broken wires, and corrosion, especially at excessive strain points;

(2) An examination of the rope fastenings for defects;

(3) An examination of the elevator for loose, missing, or defective parts;

(4) An examination of sheaves for broken flanges, defective bearings, rope alignment, and proper lubrication; and

(5) An examination of the automatic controls and brakes required under § 77.1401.

(b) A report of the daily examinations shall be signed by the person making such examination and the report shall be signed or countersigned by any of the persons listed in paragraph (d) of § 77.1713.

(c) Empty conveyances shall be operated at least one round trip before hoisting men after any repairs.

(d) Alterations or changes in a hoist or elevator which might affect its rated capacity shall be made only with the approval of the Coal Mine Health and Safety District Manager or Subdistrict Manager of the district in which the mine is located.

(e) The ropes and cables of hoists and elevators shall be kept well lubricated from end to end as recommended by the manufacturer.

Subpart P—Auger Mining

§ 77.1500 Auger mining; planning.

Auger mining shall be planned and conducted by the operator to insure against any hazard to underground workings located at or near such auger operations and all auger holes shall be located so as to prevent:

(a) The disruption of the ventilation system of any active underground mine;

(b) Inundation hazards from surface water entering any active underground mine;

(c) Damage to the roof and ribs of active underground workings; and

(d) Intersection of auger holes with underground mine workings known to contain dangerous quantities of impounded water.

§ 77.1501 Auger mining; inspections.

(a) The face of all highwalls, to a distance of 25 feet on both sides of each drilling site, shall be inspected by a certified person before any augering operation is begun, and at least once during each coal producing shift and all loose material shall be removed from the drilling site before persons are permitted to enter the drilling area. The results of all such inspections shall be recorded daily in a book approved by the Secretary.

(b) In addition, the face of all highwalls, to a distance of 25 feet on both sides of each drilling site, shall be inspected frequently by a certified person during any auger operation conducted either during or after a heavy rainfall or during any period of intermittent freezing and thawing and the results of such inspections shall be recorded as provided in paragraph (a) of this section.

(c) When an auger hole penetrates an abandoned or mined out area of an underground mine, tests for methane and oxygen deficiency shall be made at the collar of the hole by a qualified person using devices approved by the Secretary to determine if dangerous quantities of methane or oxygen-deficient air are present or being emitted. If such is found no further work shall be performed until the atmosphere has been made safe.

(d) Tests for oxygen deficiency shall be conducted with a permissible flame safety lamp or other means approved by the Secretary and all tests for methane shall be conducted with a methane detector approved by the Secretary.

(e) Internal combustion engines shall not be operated in the vicinity of any auger hole in which tests for methane or oxygen deficiency are being made.

§ 77.1502 Auger holes; restriction against entering.

No person shall be permitted to enter an auger hole except with the approval of the Coal Mine Health and Safety District Manager or Subdistrict Manager of the district in which the mine is located and under such conditions as may be prescribed by such managers.

§ 77.1503 Augering equipment; overhead protection.

(a) Auger machines which are exposed to highwall hazards, together with all those parts of any coal elevating conveyors where persons are required to work during augering operations, shall be covered with heavy gauge screen which does not obstruct the view of the highwall and is strong enough to prevent injuries to workmen from falling material.

(b) No work shall be done under any overhang and, when a crew is engaged in connecting or disconnecting auger sections under a highwall, at least one person shall be assigned to observe the highwall for possible movement.

§ 77.1504 Auger equipment; operation.

(a) Persons shall be kept clear of the auger train while it is in motion and shall not be permitted to pass under or over an auger train, except where adequate crossing facilities are provided.

(b) Persons shall be kept clear of auger sections being swung into position.

(c) No person, including the auger machine operator, shall, where practicable, be stationed in direct line with a borehole during augering operations.

(d) Operator of auger equipment shall not leave the controls of such equipment while the auger is in operation.

(e) Adequate illumination shall be provided for work areas after dark.

§ 77.1505 Auger holes; blocking.

Auger holes shall be blocked with highwall spoil or other suitable material before they are abandoned.

Subpart Q—Loading and Haulage

§ 77.1600 Loading and haulage; general.

(a) Only authorized persons shall be permitted on haulage roads and at loading or dumping locations.

(b) Traffic rules, signals, and warning signs shall be standardized at each mine and posted.

(c) Where side or overhead clearances on any haulage road or at any loading or dumping location at the mine are hazardous to mine workers, such areas shall be conspicuously marked and warning devices shall be installed when necessary to insure the safety of the workers.

§ 77.1601 Transportation of persons; restrictions.

No person shall be permitted to ride or be otherwise transported on or in the following equipment whether loaded or empty:

(a) Dippers, shovels, buckets, forks, and clamshells;

(b) The cargo space of dump trucks or haulage equipment used to transport coal or other material;

(c) Outside the cabs and beds of mobile equipment;

(d) Chain, belt, or bucket conveyors, except where such conveyors are specifically designed to transport persons; and

(e) Loaded buckets on aerial tramways.

§ 77.1602 Use of aerial tramways to transport persons.

Persons other than maintenance men shall not ride empty buckets on aerial tramways unless the following features are provided:

(a) Two independent brakes, each capable of holding the maximum load.

(b) Direct communication between terminals.

(c) Power drives with emergency power available in case of primary power failure.

(d) Buckets equipped with positive locks to prevent accidental tripping or dumping.

§ 77.1603 Trains and locomotives; authorized persons.

(a) Only authorized persons shall be permitted to ride on trains or locomotives and they shall ride in a safe position.

(b) Men shall not get on or off moving equipment, except that trainmen may get on or off of slowly moving trains.

§ 77.1604 Transportation of persons; overcrowding.

(a) No man-trip vehicle or other conveyance used to transport persons to and from work areas at surface coal mines shall be overcrowded and all persons shall ride in a safe position.

(b) Supplies, materials, and tools other than small handtools shall not be transported with men in man-trip vehicles unless such vehicles are specifically designed to make such transportation safe.

§ 77.1605 Loading and haulage equipment; installations.

(a) Cab windows shall be of safety glass or equivalent, in good condition and shall be kept clean.

(b) Mobile equipment shall be equipped with adequate brakes, and all trucks and front-end loaders shall also

be equipped with parking brakes.

(c) Positive-action type brakes shall be provided on aerial tramways.

(d) Mobile equipment shall be provided with audible warning devices. Lights shall be provided on both ends when required.

(e) Guard nets or other suitable protection shall be provided where tramways pass over roadways, walkways, or buildings.

(f) Guards shall be installed to prevent swaying buckets from hitting towers.

(g) Aerial tramway cable connections shall be designed to offer minimum obstruction to the passage of wheels.

(h) Rocker-bottom or bottom-dump cars shall be equipped with positive locking devices, or other suitable devices.

(i) Ramps and dumps shall be of solid construction, of ample width, have ample clearance and headroom, and be kept reasonably free of spillage.

(j) Chute-loading installations shall be designed so that the men pulling chutes are not required to be in a hazardous position during loading operations.

(k) Berms or guards shall be provided on the outer bank of elevated roadways.

(l) Berms, bumper blocks, safety hooks, or similar means shall be provided to prevent overtravel and overturning at dumping locations.

(m) Roadbeds, rails, joints, switches, frogs, and other elements on railroads shall be designed, installed, and maintained in a safe manner consistent with the speed and type of haulage.

(n) Where practicable, a minimum of 30 inches continuous clearance from the farthest projection of moving railroad equipment shall be provided on at least one side of the tracks; all places where it is not possible to provide 30-inch clearance shall be marked conspicuously.

(o) Track guardrails, lead rails, and frogs shall be protected or blocked so as to prevent a person's foot from becoming wedged.

(p) Positive-acting stop-blocks, derail devices, track skates, or other adequate means shall be installed wherever necessary to protect persons from runaway or moving railroad equipment.

(q) Switch throws shall be installed so as to provide adequate clearance for switchmen.

(r) Where necessary, bumper blocks or the equivalent shall be provided at all track dead ends.

§ 77.1606 Loading and haulage equipment; inspection and maintenance.

(a) Mobile loading and haulage equipment shall be inspected by a competent person before such equipment is placed in operation. Equipment defects affecting safety shall be recorded and reported to the mine operator.

(b) Carriers on aerial tramways, including loading and unloading mechanisms, shall be inspected each shift; brakes shall be inspected daily; ropes and supports shall be inspected as recommended by the manufacturer or as physical conditions warrant. Equipment defects affecting safety shall be reported to the mine operator.

(c) Equipment defects affecting safety shall be corrected before the equipment is used.

§ 77.1607 Loading and haulage equipment; operation.

(a) Vehicles shall follow at a safe distance; passing shall be limited to areas of adequate clearance and visibility.

(b) Mobile equipment operators shall have full control of the equipment while it is in motion.

(c) Equipment operating speeds shall be prudent and consistent with conditions of roadway, grades, clearance, visibility, traffic, and the type of equipment used.

(d) Cabs of mobile equipment shall be kept free of extraneous materials.

(e) Operators shall sit facing the direction of travel while operating equipment with dual controls.

(f) When an equipment operator is present, men shall notify him before getting on or off equipment.

(g) Equipment operators shall be certain, by signal or other means, that all persons are clear before starting or moving equipment.

(h) Where possible, aerial tramways shall not be started until the tramway operator has ascertained that everyone is in the clear.

(i) Dust control measures shall be taken where dust significantly reduces visibility of equipment operators.

(j) Dippers, buckets, loading booms, or heavy suspended loads shall not be swung over the cabs of haulage vehicles until the drivers are out of the cabs and in safe locations, unless the trucks are designed specifically to protect the drivers from falling material.

(k) Men shall not work or pass under the buckets or booms of loaders in operation.

(l) Tires shall be deflated before repairs on them are started and adequate means shall be provided to prevent wheel locking rims from creating a hazard during tire inflation.

(m) Electrically powered mobile equipment shall not be left unattended unless the master switch is in the off position, all operating controls are in the neutral position, and the brakes are set or other equivalent precautions are taken against rolling.

(n) Mobile equipment shall not be left unattended unless the brakes are set. The wheels shall be turned into a bank or berm, or shall be blocked, when such equipment is parked on a grade.

(o) Lights, flares, or other warning devices shall be posted when parked equipment creates a hazard to vehicular traffic.

(p) Dippers, buckets, scraper blades, and similar movable parts shall be secured or lowered to the ground when not in use.

(q) Shovel trailing cables shall not be moved with the shovel dipper unless cable slings or sleds are used.

(r) Equipment which is to be hauled shall be loaded and protected so as to prevent sliding or spillage.

(s) When moving between work areas, the equipment shall be secured in the travel position.

(t) Any load extending more than 4 feet beyond the rear of the vehicle body should be marked clearly with a red flag by day and a red light at night.

(u) Tow bars shall be used to tow heavy equipment and a safety chain shall be used in conjunction with each tow bar.

(v) Railroad cars shall be kept under control at all times by the car dropper. Cars shall be dropped at a safe rate and in a manner that will insure that the car dropper maintains a safe position while working and traveling around the cars.

(w) Railroad cars shall not be coupled or uncoupled manually from the inside of curves unless the railroad and cars are so designed to eliminate any hazard from coupling or uncoupling cars from inside of curves.

(x) Persons shall wear safety belts when dropping railroad cars.

(y) Railcars shall not be left on side-tracks unless ample clearance is provided for traffic on adjacent tracks.

(z) Parked railcars, unless held effectively by brakes, shall be blocked securely.

(aa) Railroad cars and all trucks shall be trimmed properly when they have been loaded higher than the confines of their cargo space.

(bb) When the entire length of a conveyor is visible from the starting switch, the operator shall visually check to make certain that all persons are in the clear before starting the conveyor. When the entire length of the conveyor is not visible from the starting switch, a positive audible or visible warning system shall be installed and operated to warn persons that the conveyor will be started.

(cc) Unguarded conveyors with walkways shall be equipped with emergency stop devices or cords along their full length.

(dd) Adequate backstops or brakes shall be installed on inclined-conveyor drive units to prevent conveyors from running in reverse if a hazard to personnel would be caused.

(ee) Aerial tram conveyor buckets shall not be overloaded, and feed shall be regulated to prevent spillage.

§ 77.1608 Dumping facilities.

(a) Dumping locations and haulage roads shall be kept reasonably free of water, debris, and spillage.

(b) Where the ground at a dumping place may fail to support the weight of a loaded dump truck, trucks shall be dumped a safe distance back from the edge of the bank.

(c) Adequate protection shall be provided at dumping locations where persons may be endangered by falling material.

(d) Grizzlies, grates, and other sizing devices at dump and transfer points shall be anchored securely in place.

(e) If truck spotters are used, they shall be well in the clear while trucks are backing into dumping position and dumping; lights shall be used at night to direct trucks.

Subpart R—Miscellaneous

§ 77.1700 Communications in work areas.

No employee shall be assigned, or allowed, or be required to perform work alone in any area where hazardous conditions exist that would endanger his safety unless he can communicate with others, can be heard, or can be seen.

§ 77.1701 Emergency communications; requirements.

(a) Each operator of a surface coal mine shall establish and maintain a communication system from the mine to the nearest point of medical assistance for use in an emergency.

(b) The emergency communication system required to be maintained under paragraph (a) of this section may be established by telephone or radio transmission or by any other means of prompt communication to any facility (for example, the local sheriff, the State highway patrol, or local hospital) which has available the means of communication with the person or persons providing emergency medical assistance or transportation in accordance with the provisions of paragraph (a) of this section.

§ 77.1702 Arrangements for emergency medical assistance and transportation for injured persons; reporting requirements; posting requirements.

(a) Each operator of a surface coal mine shall make arrangements with a licensed physician, medical service, medical clinic, or hospital to provide 24-hour emergency medical assistance for any person injured at the mine.

(b) Each operator shall make arrangements with an ambulance service, or otherwise provide for 24-hour emergency transportation for any person injured at the mine.

(c) Each operator shall, on or before June 30, 1971, report to the Coal Mine Health and Safety District Manager for the district in which the mine is located the name, title and address of the physician, medical service, medical clinic, hospital, or ambulance service with whom arrangements have been made, or otherwise provided, in accordance with the provisions of paragraphs (a) and (b) of this section.

(d) Each operator shall, within 10 days after any change of the arrangements required to be reported under the provisions of this section, report such changes to the Coal Mine Health and Safety District Manager. If such changes involve a substitution of persons, the operator shall provide the name, title, and address of the person substituted together with the name and address of the medical service, medical clinic, hospital, or ambulance service with which such person or persons are associated.

(e) Each operator shall, immediately after making an arrangement required

under the provisions of paragraphs (a) and (b) of this section, or immediately after any change, of such agreement, post at appropriate places at the mine the names, titles, addresses, and telephone numbers of all persons or services currently available under such arrangements to provide medical assistance and transportation at the mine.

§ 77.1703 First aid training; supervisory employees.

On or before September 30, 1971, each operator of a surface coal mine shall conduct a first aid training course for selected supervisory employees at the mine, and report in writing to the District Manager the names and job titles of all supervisory employees so trained. Thereafter, each operator shall, within 60 days after the selection of a new supervisory employee to be trained, report in writing to the Coal Mine Health and Safety District Manager the name and job title of such employee and the date on which such employee satisfactorily completed the first aid training course.

§ 77.1704 First aid training program; availability of instruction to all miners.

On or before December 30, 1971, each operator of a surface coal mine shall make available to all miners employed in the mine a course of instruction in first aid conducted by the operator or under the auspices of the operator, and such a course of instruction shall be made available to newly employed miners within 6 months after the date of employment.

§ 77.1705 First aid training program; retraining of supervisory employees; availability to all miners.

Beginning January 1, 1971, each operator of a surface coal mine shall conduct refresher first aid training programs each calendar year for all selected supervisory employees and make available refresher first aid training courses to all miners employed in the mine.

§ 77.1706 First aid training program; minimum requirements.

(a) All first aid training programs required under the provisions of §§ 77.1703 and 77.1704 shall include 10 class hours of training in a course of instruction similar to that outlined in "First Aid, A Bureau of Mines Instruction Manual."

(b) Refresher first aid training programs required under the provisions of § 77.1705 shall include 5 class hours of refresher training in a course of instruction similar to that outlined in "First Aid, A Bureau of Mines Instruction Manual."

§ 77.1707 First aid equipment; location; minimum requirements.

(a) Each operator of a surface coal mine shall maintain a supply of the first aid equipment set forth in paragraph (b) of this section at or near each working place where coal is being mined, at each preparation plant and at shops and

other surface installation where ten or more persons are regularly employed.

(b) The first aid equipment required to be maintained under the provisions of paragraph (a) of this section shall include at least the following:

- (1) One stretcher;
- (2) One broken-back board (if a splint-stretcher combination is used it will satisfy the requirements of both subparagraph (1) of this paragraph and this subparagraph (2));
- (3) Twenty-four triangular bandages (15 if a splint-stretcher combination is used);
- (4) Eight 4-inch bandage compresses;
- (5) Eight 2-inch bandage compresses;
- (6) Twelve 1-inch adhesive compresses;
- (7) An approved burn remedy;
- (8) Two cloth blankets;
- (9) One rubber blanket or equivalent substitute;
- (10) Two tourniquets;
- (11) One 1-ounce bottle of aromatic spirits of ammonia or 1 dozen ammonia ampules; and,
- (12) The necessary complements of arm and leg splints or two each inflatable plastic arm and leg splints.

(c) All first aid supplies required to be maintained under the provisions of paragraphs (a) and (b) of this section shall be stored in suitable, sanitary, dust tight, moisture proof containers and such supplies shall be accessible to the miners.

§ 77.1708 Safety program; instruction of persons employed at the mine.

On and after June 30, 1971, each operator of a surface coal mine shall establish and maintain a program of instruction with respect to the safety regulations and procedures to be followed at the mine and shall publish and distribute to each employee, and post in conspicuous places throughout the mine, all such safety regulations promulgated in accordance with the provisions of this section.

§ 77.1709 Safety training; inexperienced employees.

New employees shall be indoctrinated in safety rules and safe work procedures and inexperienced employees shall not be assigned to work duties until they have been trained thoroughly in safe work procedures related to the assigned work duties.

§ 77.1710 Protective clothing; requirements.

On and after June 30, 1971, each employee of a surface coal mine shall be required to wear protective clothing and devices as indicated below:

(a) Protective clothing or equipment and face-shields or goggles shall be worn when welding, cutting, or working with molten metal or when other hazards to the eyes exist.

(b) Suitable protective clothing to cover the entire body when handling corrosive or toxic substances or other materials which might cause injury to the skin.

(c) Protective gloves when handling materials or performing work which

might cause injury to the hands; however, gloves shall not be worn where they would create a greater hazard by becoming entangled in the moving parts of equipment.

(d) A suitable hard hat when in or around a mine or plant where falling objects may create a hazard.

(e) Suitable protective footwear.

(f) Snug-fitting clothing when working around moving machinery or equipment.

(g) Safety belts and lines where there is danger of falling; a second person shall tend the lifeline when bins, tanks, or other dangerous areas are entered.

(h) Lifejackets or belts where there is danger from falling into water.

(i) Seatbelts in a vehicle where there is a danger of overturning and where roll protection is provided.

§ 77.1711 Smoking prohibition.

No person shall smoke or use an open flame where such practice may cause a fire or explosion.

§ 77.1712 Reopening mines; notification; inspection prior to mining.

Prior to reopening any surface coal mine after it has been abandoned or declared inactive by the operator, the operator shall notify the Coal Mine Health and Safety District Manager for the district in which the mine is located, and an inspection of the entire mine shall be completed by an authorized representative of the Secretary before any mining operations in such mine are instituted.

§ 77.1713 Daily inspection of surface coal mine; certified person; reports of inspection.

(a) At least once during each working shift, or more often if necessary for safety, each active working area and each active surface installation shall be examined by a certified person designated by the operator to conduct such examinations for hazardous conditions and any hazardous conditions noted during such examinations shall be reported to the operator and shall be corrected by the operator.

(b) If any hazardous condition noted during an examination conducted in accordance with paragraph (a) of this section creates an imminent danger, the person conducting such examination shall notify the operator and the operator shall withdraw all persons from the area affected, except those persons referred to in section 104(d) of the Act, until the danger is abated.

(c) After each examination conducted in accordance with the provisions of paragraph (a) of this section, each certified person who conducted all or any part of the examination required shall enter with ink or indelible pencil in a book approved by the Secretary the date and a report of the condition of the mine or any area of the mine which he has inspected together with a report of the nature and location of any hazardous condition found to be present at the mine. The book in which such entries are made shall be kept in an area at the mine designated by the operator to

minimize the danger of destruction by fire or other hazard.

(d) All examination reports recorded in accordance with the provisions of paragraph (c) of this section shall include a report of the action taken to abate hazardous conditions and shall be signed or countersigned each day by at least one of the following persons:

- (1) The surface mine foreman;
- (2) The assistant superintendent of the mine;
- (3) The superintendent of the mine; or,
- (4) The person designated by the operator as responsible for health and safety at the mine.

Subpart S—Trolley Wires and Trolley Feeder Wires

§ 77.1800 Cutout switches.

Trolley wires and trolley feeder wires, shall be provided with cutout switches at intervals of not more than 2,000 feet and near the beginning of all branch lines.

§ 77.1801 Overcurrent protection.

Trolley wires and trolley feeder wires shall be provided with overcurrent protection.

§ 77.1801-1 Devices for overcurrent protection.

Automatic circuit interrupting devices that will deenergize the affected circuit upon occurrence of a short circuit at any point in the system will meet the requirements of § 77.1801.

§ 77.1802 Insulation of trolley wires, trolley feeder wires, and bare signal wires; guarding of trolley wires and trolley feeder wires.

Trolley wires, trolley feeder wires, and bare signal wires shall be adequately guarded:

(a) At all points where men are required to work or pass regularly under the wires; and

(b) At man-trip stations.

The Secretary or his authorized representative shall specify other conditions where trolley wires and trolley feeder wires shall be adequately protected to prevent contact by any person, or shall require the use of improved methods to prevent such contact. Temporary guards shall be provided where trackmen and other persons are required to work in proximity to trolley wires and trolley feeder wires.

Subpart T—Slope and Shaft Sinking

§ 77.1900 Slopes and Shafts; approval of plans.

(a) Each operator of a coal mine shall prepare and submit for approval by the Coal Mine Health and Safety District Manager for the district in which the mine is located, a plan providing for the safety of workmen in each slope or shaft that is commenced or extended after June 30, 1971. The plan shall be consistent with prudent engineering design. The methods employed by the operator shall be selected to minimize the hazards

to those employed in the initial or subsequent development of any such slope or shaft, and the plan shall include the following:

- (1) The name and location of the mine, and the Bureau of Mines mine identification number, if known;
- (2) The name and address of the mine operator;
- (3) A description of the construction work and methods to be used in the construction of the slope or shaft, and whether part or all of the work will be performed by a contractor and a description of that part of the work to be performed by a contractor.
- (4) The elevation, depth and dimensions of the slope or shaft;
- (5) The location and elevation of the coalbed;
- (6) The general characteristics of the strata through which the slope or shaft will be developed;
- (7) The type of equipment which the operator proposes to use when the work is to be performed by the operator. When work is to be performed by a contractor the operator shall, as soon as known to him, supplement the plan with a description of the type of equipment to be used by the contractor;
- (8) The system of ventilation to be used; and
- (9) Safeguards for the prevention of caving during excavation.

§ 77.1900-1 Compliance with approved slope and shaft sinking plans.

Upon approval by the Coal Mine Health and Safety District Manager of a slope or shaft sinking plan, the operator shall adopt and comply with such plan.

§ 77.1901 Preshift and onshift inspections; reports.

(a) Examinations of slope and shaft areas shall be made by a certified person for hazardous conditions, including tests for methane and oxygen deficiency:

- (1) Within 90 minutes before each shift;
- (2) At least once on any shift during which men are employed inside any slope or shaft during development; and
- (3) Both before and after blasting.

(b) The surface area surrounding each slope and shaft shall be inspected by a certified person and all hazards in the vicinity shall be corrected before men are permitted to enter the excavation.

(c) All hazards found during any pre-shift or onshift inspection shall be corrected before men are allowed to enter, or continue to work in such slope or shaft. If hazardous conditions cannot be corrected, or excessive methane concentrations cannot be diluted, the excavation shall be vacated and no person shall be permitted to reenter the slope or shaft to continue excavation operations until the hazardous condition has been abated.

(d) No work shall be performed in any slope or shaft, no drilling equipment shall be started, and no electrical equipment shall be energized if the methane content in such slope or shaft is 1.0 volume per centum, or more.

(e) Nothing in this § 77.1901 shall prevent the specific assignment of men in the slope or shaft for purposes of abating excessive methane concentrations or any other hazardous condition.

(f) The results of all inspections conducted in accordance with the provisions of paragraph (a) of this section shall be recorded in a book approved by the Secretary.

§ 77.1901-1 Methane and oxygen deficiency tests; approved devices.

Tests for oxygen deficiency shall be made with a permissible flame safety lamp or other means approved by the Secretary, and tests for methane shall be made with a methane detector approved by the Secretary.

§ 77.1902 Drilling and mucking operations.

Diesel-powered equipment used in the drilling, mucking, or other excavation of any slope or shaft shall be permissible, and such equipment shall be operated in a permissible manner and shall be maintained in a permissible condition.

§ 77.1902-1 Permissible diesel-powered equipment.

Diesel-powered equipment which has been approved by the Bureau of Mines under Part 36 of this chapter (Bureau of Mines Schedule 31) is permissible under the provisions of this section.

§ 77.1903 Hoists and hoisting; minimum requirements.

(a) Hoists employed in transporting men and material during drilling, mucking, or other excavating operations in any slope or shaft shall have rated capacities consistent with the loads to be handled and the recommended safety factors of the ropes used in such hoists.

(b) The American National Standards Institute, "Specifications For The Use Of Wire Ropes For Mines," M 11.1-1960, or the latest revision thereof, shall be used as a guide in the use, selection, installation, and maintenance of wire ropes used for hoisting.

(c) Each hoist employed in drilling, mucking, or other excavating operations shall be equipped with an accurate and reliable indicator of the position of the cage, platform, or bucket, which shall be installed in clear view of the hoist operator.

§ 77.1904 Communications between slope and shaft bottoms and hoist operators.

(a) Two independent means of signaling shall be provided between the hoistman and all points in a slope or shaft where men are required to work. At least one of these means shall be audible to the hoistman. Signal codes used in any communication system shall be posted conspicuously at each slope and shaft.

(b) Signaling systems used for communication between slopes and shafts and the hoistman shall be tested daily.

§ 77.1905 Hoist safeguards; general.

(a) Hoists used to transport persons shall be equipped with brakes capable of

stopping and holding the cage, bucket, platform, or other device when fully loaded.

(b) When persons are transported by a hoist, a second person familiar with and qualified to stop the hoist shall be in attendance, except where the hoist is fully equipped with overspeed, overwind, and automatic stop devices.

§ 77.1906 Hoists; daily inspection.

(a) Hoists used to transport persons shall be inspected daily, and each such inspection shall include examination of the headgear (headframe, sheave wheels, etc.), ropes, connections, links and chains, and other facilities.

(b) Prior to each working shift, and before a hoist is returned to service after it has been out of normal service for any reason, it shall be operated by the hoistman through one complete cycle of operation before any person is permitted to be transported.

(c) The results of all inspections conducted in accordance with this section shall be recorded in a book approved by the Secretary, and shall be signed by the person making the inspection and shall be signed or countersigned by any of the persons listed in paragraph (d) of § 77.1713.

§ 77.1907 Hoist construction; general.

(a) Hoisting ropes shall be equipped with a spelter-filled socket or a thimble with an adequate number of clamps properly spaced and installed along the rope.

(b) Cages, buckets, or slope cars when used for hoisting or lowering men shall be provided with two bridle chains or cables connected securely to the rope at least 3 feet above the socket or thimble and which are securely fastened to the cage, bucket or slope car.

(c) Where hooks are used to attach cages or buckets to the socket or thimble of a hoisting rope, they shall be self-closing.

(d) Hoisting ropes shall contain at least three full turns on the hoist drum when the rope is extended to its maximum working length. At least one full turn of the hoist rope shall be placed around the drum shaft or around the spoke of a free drum and both shall be fastened securely by means of clamps.

§ 77.1908 Hoist installations; use.

(a) Where men are transported by means of a hoist and the depth of the shaft exceeds 50 feet, the hoist rope shall be suspended from a substantial hoisting installation which shall be high enough to provide working clearance between the bottom of the sheave and the top of the cage or bucket.

(b) Where men are transported by means of a hoist and the depth of the shaft exceeds 100 feet, temporary shaft guides and guide attachments, or other no less effective means, shall be installed to prevent the cage, platform, or bucket from swinging.

(c) All guides and guide attachments, or other no less effective means, installed in accordance with paragraph (b) of this section shall be maintained to a depth

of not less than 75 feet from the bottom of the shaft.

(d) Where crossheads are used, the cage, platform, or bucket shall not be hung more than 10 feet below the crosshead.

(e) Where men are required to embark or disembark from a cage, platform or bucket suspended over or within a shaft, a loading platform shall be installed to insure safe footing.

(f) During the development of each slope or shaft, either a ladder or independently powered auxiliary hoist shall be provided to permit men to escape quickly in the event of an emergency.

(g) No person shall be permitted to ride the rim of any bucket or on the top of a loaded bucket.

(h) The number of persons permitted to ride in cages, skips, or buckets shall be limited so as to prevent overcrowding.

(i) Persons shall not be permitted to ride on a cage, skip, or bucket with tools or materials, except when necessary to handle equipment while in transit. Materials shall be secured to prevent shifting while being hoisted.

(j) The speed of buckets transporting persons shall not exceed 500 feet per minute and not more than 200 feet per minute when within 100 feet of any stop.

(k) A notice of established speeds shall be posted in clear view of the hoistman.

(l) Conveyances being lowered in a shaft in which men are working shall be stopped at least 15 feet above such men and shall be lowered further only after the hoistman has received a signal that all men who may be endangered by the conveyance are in the clear.

(m) No skip or bucket shall be raised or lowered in a slope or shaft until it has been trimmed to prevent material from falling back down the slope or shaft.

(n) Measures shall be taken to prevent material from falling back into the shaft while buckets or other conveyances are being unloaded.

(o) Properly attached safety belts shall be worn by all persons required to work in or over any shaft where there is a drop of 10 or more feet, unless other acceptable means are provided to prevent such persons from falling into the shaft.

§ 77.1908-1 Hoist operation; qualified hoistman.

Hoists shall be under the control of and operated by a qualified hoistman when men are in a slope or shaft.

§ 77.1909 Explosives and blasting; use of permissible explosives and shot-firing units.

Except as provided in § 77.1909-1, only permissible explosives and permissible shot-firing units shall be used in sinking shafts and slopes.

§ 77.1909-1 Use of nonpermissible explosives and nonpermissible shot-firing units; approval by Health and Safety District Manager.

Where the Coal Mine Health and Safety District Manager has determined that the use of nonpermissible explosives

and nonpermissible shot-firing units will not pose a hazard to any person during the development of a slope or shaft, he may, after written application by the operator, approve the use of such explosives and shot-firing units and issue a permit for the use of such explosives and devices setting forth the safeguards to be employed by the operator to protect the health and safety of any person exposed to such blasting.

§ 77.1910 Explosives and blasting; general.

(a) Light and power circuits shall be disconnected or removed from the blasting area before charging and blasting.

(b) All explosive materials, detonators, and any other related blasting material employed in the development of any slope or shaft shall be stored, transported, carried, charged, and fired in accordance with the provision of Subpart N, "Explosives and Blasting," of this Part 77. Except as provided in paragraph (c) of this section, all shots shall be fired from the surface.

(c) Where tests for methane have been conducted and methane has not been found and only permissible blasting units are being employed, shots may be fired from an upper level of the slope or shaft.

(d) Except as provided in paragraph (c) of this section, all men shall be removed from the slope or shaft prior to blasting.

(e) Blasting areas in slopes or shafts shall be covered with mats or other suitable material when the excavation is too shallow to retain blasted material.

(f) Where it is impracticable to prepare primers in the blasting area, primers may be prepared on the surface and carried into the shaft in specially constructed, insulated, covered containers.

(g) No other development operation shall be conducted in a shaft or at the face of a slope while drill holes are being charged and until after all shots have been fired.

(h) The sides of the slope or shaft between the overhead platform and the bottom where men are working shall be examined after each blast and loose material removed.

(i) Loose rock and other material shall be removed from timbers and platforms after each blast before men are lowered to the shaft bottom.

§ 77.1911 Ventilation of slopes and shafts.

(a) All slopes and shafts shall be ventilated by mechanical ventilation equipment during development. Such equipment shall be examined before each shift and the quantity of air in the slope or shaft measured daily by a certified person and the results of such examinations and tests recorded in a book approved by the Secretary.

(b) Ventilation fans shall be:

(1) Installed on the surface;

(2) Installed in fireproof housing and connected to the slope or shaft opening with fireproof air ducts;

(3) Designed to permit the reversal of the air current, and located in an area which will prevent a recirculation of air from the slope or shaft or air contamination from any other source;

(4) Equipped with an automatic signal device designed to give an alarm in the event the fan slows or stops which can be seen or heard by any person on duty in the vicinity of the fan, except where fans are constantly attended.

(5) Offset not less than 15 feet from the shaft; and

(6) Equipped with air ducts which are fire resistant and maintained so as to prevent excessive leakage of air;

(i) Flexible ducts shall be constructed to permit ventilation by either exhausting or blowing methods and when metal air ducts are used, they shall be grounded effectively to remove static and other electrical charges;

(ii) Ducts shall extend as close to the bottom as necessary to ventilate properly.

(c) A qualified person, designated by the operator, shall be assigned to maintain each ventilating system.

(d) The fan shall be operated continuously when men are below the surface. Any accidental stoppage or reduction in airflow shall be corrected promptly; however, where repairs cannot be made immediately, development work below the surface shall be stopped and all the men not needed to make necessary repairs shall be removed to the surface.

§ 77.1912 Ladders and stairways.

(a) Substantial stairways or ladders shall be used during the construction of all shafts where no mechanical means are provided for men to travel.

(b) Landings at intervals of not more than 30 feet shall be installed.

(c) Shaft ladders shall project 3 feet above the collar of the shaft, and shall be placed at least 3 inches from the side of the shaft.

§ 77.1913 Fire-resistant wood.

Except for crossties, timbers, and other wood products which are permanently installed in slopes and shafts, shall be fire resistant.

§ 77.1914 Electrical equipment.

(a) Electric equipment employed below the collar of a slope or shaft during excavation shall be permissible and shall be maintained in a permissible condition.

(b) The insulation of all electric conductors employed below the collar of any slope or shaft during excavation shall be of the flame resistant type.

(c) Only lamps and portable flood lights approved by the Bureau of Mines under Part 19 and Part 20 of this chapter (Bureau of Mines Schedules 6D and 10C) shall be employed below the collar of any slope or shaft.

§ 77.1915 Storage and handling of combustible materials.

(a) Compressed and liquefied gas, oil, gasoline, and other petroleum products shall not be stored within 100 feet of any slope or shaft opening.

(b) Other combustible material and supplies shall not be stored within 25 feet of any slope or shaft opening.

(c) Pyritic slates, bony coal, culm or other material capable of spontaneous combustion shall not be used for fill or as surfacing material within 100 feet of any slope or shaft opening.

(d) Areas surrounding the opening of each slope or shaft shall be constructed to insure the drainage of flammable liquids away from the slope or shaft in the event of spillage.

(e) Oily rags, waste paper, and other combustible waste material disposed of in the vicinity of any slope or shaft opening shall be stored in closed containers until removed from the area.

§ 77.1916 Welding, cutting, and soldering; fire protection.

(a) One portable fire extinguisher shall be provided where welding, cutting, or soldering with arc or flame is performed.

(b) Welding, cutting, or soldering with arc or flame within or in the vicinity of any slope or shaft, except where such operations are performed in fireproof enclosures, shall be done under the supervision of a qualified person who shall make a diligent search within or in the vicinity of the slope or shaft for fire during and after such operations.

(c) Before welding, cutting, or soldering is performed in any slope or shaft designed to penetrate into any coalbed below the surface, an examination for methane shall be made by a qualified person with a device approved by the Secretary for detecting methane. Examination for methane shall be made immediately before and periodically during welding, cutting, or soldering and such work shall not be permitted to commence or continue in air which contains 1.0 volume per centum or more of methane.

(d) Noncombustible barriers shall be installed below welding, cutting, or soldering operations in or over a shaft.

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