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**An Underground Coal Mine Fire Preparedness
and Response Checklist: The Instrument**



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

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**An Underground Coal Mine Fire Preparedness
and Response Checklist: The Instrument**

**By Ronald S. Conti, Linda L. Chasko, Charles P. Lazzara, Ph.D.,
and Gary Braselton**

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

Btu	British thermal unit	m/sec	meter(s) per second
fpm	foot (feet) per minute	mg/L	milligram(s) per liter
ft	foot (feet)	min	minute(s)
ft/min	foot (feet) per minute	oz	ounce(s)
ft ³ /min	cubic foot (feet) per minute	ppm	part(s) per million
gal	gallon(s)	psi	pound(s) (force) per square inch
gpm	gallon(s) per minute	psig	pound(s) (force) per square inch, gauge
hr	hour(s)	sec	second(s)
in	inch(es)	yd	yard(s)
lb	pound(s)	EF	degrees Fahrenheit

AN UNDERGROUND COAL MINE FIRE PREPAREDNESS AND RESPONSE CHECKLIST: THE INSTRUMENT

By Ronald S. Conti,¹ Linda L. Chasko,² Charles P. Lazzara, Ph.D.³ and Gary Braselton⁴

ABSTRACT

Preparedness is an important element of any underground mine's strategic plan in dealing with an unexpected event, such as a fire. A fully implemented fire preparedness and response plan is essential in reducing the probability and seriousness of a mine fire. This report describes the development of an underground coal mine fire preparedness and response checklist (MFPRC). The checklist is a data collection instrument for profiling both the fire prevention and response capabilities of a mine site and usually requires 3 to 4 days to complete. The checklist encompasses conditions, procedures, and equipment that have frequently been identified as the primary or contributing causes of underground coal mine fires. At least 1 day is needed underground to evaluate the water system. This entails measurements of waterflows and pressures at fire hydrants, and water throw distances of fire hose and nozzles at several locations (mains and branch lines). A few of the other topics that are discussed with mine personnel include detection and suppression systems, combustible materials, mine rescue and fire brigades, and firefighting equipment.

The MFPRC was developed by the National Institute for Occupational Safety and Health (NIOSH), Pittsburgh Research Laboratory. Under a Cooperative Research and Development Agreement (CRADA) with Cyprus Amax, Twentymile Coal Co. (Oak Creek, CO), the checklist was field tested and further refined. Additional field tests were conducted at several other operating coal mines.

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BACKGROUND

Fires are still too common an occurrence in the mining industry. Statistics from the Mine Safety and Health Administration (MSHA)⁵ indicate that 153 reportable fires (i.e., fires lasting more than 30 min after discovery or causing injury) occurred at underground coal mines from 1990 to 1999 in the United States, causing 1 fatality and 46 injuries. A significantly higher number of unreportable fires are believed to have occurred. A recent fire happened on November 25, 1998, at Cyprus Plateau Mining Corp.'s Willow Creek underground mine near Price, UT, during coal production. Forty-five miners evacuated. The mine was sealed, and inert gas was injected into the fire area. Mine rescue teams entered the sealed mine on December 9, 1998, to initiate recovery operations. Another fire occurred on January 26, 1999, at Oxbow Mining, Inc.'s Sanborn Creek underground coal mine near Somerset, CO. All of the miners were evacuated, the mine was temporarily sealed, and water was pumped into the mine through a borehole to inundate the suspected fire area. Historically, mine fires have caused fatalities, injuries, and economic losses totaling hundreds of millions of dollars. One goal of the National Institute for Occupational Safety and Health's (NIOSH) Pittsburgh Research Laboratory (PRL) is to enhance the safety of the mine worker by preventing disasters caused by fires and explosions.

The remote nature of underground mining requires workers at all positions within the organization to maintain higher skill levels in emergency response compared with workers in many other industries. Traditional work organizations can, in greater part, rely on professional, full-time, expert community services, and specialists to assist in the response to fire, rescue, and medicalemergencies. For example, smaller cities and towns have volunteer fire departments that are highly capable. The issue of measuring fire preparedness for the individual mine site is critical for predicting the response (including elements of evacuation and firefighting) in case of an underground fire.

Fire is a major concern for those who work underground. A mine fire can occur at any time and often results in a partial or total evacuation of mine personnel. Therefore, a workforce that is well trained to prevent, detect, and fight a fire is important. It is also paramount for miners to maintain and know their escape routes. However, a study by Vaught et al. [1996] of the underground preparedness of miners at seven underground coal mines showed that only 8% of the miners were satisfied with the firefighting training they were receiving. Some of these miners called for less complacency and more involvement by the workers. Out of 214 miners surveyed, 38% reported that they were notified sometime during their mining career to evacuate the mine because of a fire, and 70% were involved in at least 1 firefighting incident.

The success of safely controlling and extinguishing an incipient mine fire depends on several factors, such as an awareness of the fire hazards, early detection, availability of effective firefighting equipment, quick response time, and trained firefighters. If a coal mine fire cannot be contained by direct firefighting methods within a few hours after discovery, the chances of successfully extinguishing the fire without sealing part of the mine or the entire mine are greatly diminished. Many mine operators and workers are not aware of how quickly mine fires can spread, have little knowledge of the magnitude of a detectable fire, and lack experience in the proper selection and use of modern firefighting equipment. Information on the latest mine fire detection, alarm, and extinguishing technologies, and firefighting strategies may be difficult to obtain. Such equipment and techniques could significantly improve the success rate of safe firefighting operations and reduce the risk and occurrence of severe mine fires.

Fire research conducted by the former U.S. Bureau of Mines (USBM) and actual mine fires have shown that fires can spread very rapidly. For example, large-scale fire gallery experiments have shown that conveyor belt fires can propagate at rates greater than 0.10 m/sec (20 fpm) [Lazzara and Perzak 1990]. Still, many in the mining industry believe that fire-resistant belting will not burn. Modern fire detection and firefighting equipment, although available, is not often found in underground mines. Longer detection times result when fire sensors with slow response times are employed [Conti and Litton 1992, 1993; Morrow and Litton 1992]. Often, mine fires grow out of control due to poor planning, inoperative detection systems, inadequate water supplies, inappropriate firefighting equipment, broken water lines, failed suppression systems, and improper personal protective equipment.

Mitchell [1996] states that "the best facilities and equipment can never compensate for poor preparation." A large part of mine fire preparedness is worker capability, experience, motivation, and training, along with a strong commitment by management. Facilities and programs for mine personnel to learn about the hazards of mine fires, evaluate modern fire detection and firefighting equipment and technologies, and observe the proper methods to combat mine fires are lacking. Mine fire application seminars and briefings, sponsored by MSHA at the National Mine Health and Safety Academy [Moser 1993] and conducted by NIOSH at PRL's Lake Lynn Laboratory,⁶ are positive steps. Conti [1994] suggested that increasing the mining industry's awareness of the dangers of underground mine fires and conducting periodic fire audits with a well-organized checklist could reduce the probability of a major fire and improve the current state of fire preparedness.

⁵Mine fire statistics were obtained from MSHA's Denver Safety and Health Technology Center, Injury and Employment Information Branch, Denver, CO.

⁶PRL conducts open industry briefings on mine fire preparedness to enhance the mining industry's awareness of the dangers of underground mine fires and convey research findings on the latest methods for detection, control, response, and extinguishment of mine fires.

UNDERGROUND COAL MINE FIRE PREPAREDNESS AND RESPONSE CHECKLIST

The underground coal mine fire preparedness and response checklist (MFPRC) (appendix A) is a data collection instrument used to profile both the fire prevention and response capabilities of a mine site. This instrument can be used as an aid in determining how well the mine meets certain portions of the minimum requirements specified by 30 CFR or exceeds them. Under a Cooperative Research and Development Agreement (CRADA) with Twentymile Coal Co., Oak Creek, CO, the checklist was field tested and further refined. Additional field tests were conducted at several other operating coal mines. The checklist encompasses conditions, procedures, and equipment that have frequently been identified as the primary or contributing causes of underground coal mine fires. The checklist usually requires 3 to 4 days at the mine site to complete. At least 1 day is needed underground to evaluate the water system. Other topics that are discussed with mine personnel include detection and suppression systems, combustible materials, mine rescue and fire brigades, and firefighting equipment. Tables are included in the MFPRC to tabulate the data. The checklist provides an instant picture of the preparedness of the mine to prevent or respond to a fire and identifies areas that need to be strengthened. After the MFPRC is completed at a mine site, a data summary is prepared by NIOSH personnel and forwarded to the appropriate mine officials, or the summary can be compiled by the operator.

WATER SYSTEM

In the event of an underground coal mine fire, it is critical to extinguish the fire in its early stages. Any delay in initiating firefighting activities can result in an uncontrolled fire. Water is an effective and economical fire extinguishing agent, and it is usually abundant and easily pumped. However, water may not always be available in sufficient quantity to fight a large fire. Considerable planning should be given to adequate water supplies, water lines, hydrants and their locations, water pressures, types and sizes of nozzles, and an appropriate hands-on training program. It is crucial that an adequate amount of water hose or line be readily available in a mine and that all fittings are standardized to ensure equipment compatibility. Preparations should be made to extend water lines in case a fire starts in a remote section of the mine.

The MFPRC requires measurements of waterflows and pressures at fire hydrants and water throw distances of the fire hose and nozzles at several underground locations (main and branch lines). The quantity and quality of the water available for firefighting are determined and storage facilities examined. A surface water storage tank at an underground mine is shown in figure 1. Figure 2 illustrates testing of the throw distance of a water hose. Fire hydrant locations and markings are checked, as well as procedures to store and test water hose and nozzles. The inspection of an underground fire hydrant is shown in figure 3. The underground storage of water hose in a barrel and in a rack is shown in figures 4 and 5, respectively.

The MFPRC includes tables to record the names of main and branch water lines, pipe sizes and schedules, type of material, and safe operating pressures. Measured waterflow and pressures at fire hydrants are also noted. A fire nozzle table lists the total number, type, and pressure rating of nozzles on the surface and underground. A fire hose table identifies the location of water hoses, both on the surface and underground, and includes total length, size, thread type, material, and pressure ratings. Another table lists the throw distance of the water stream at various locations with respect to entry height, water hose size, and type of water nozzle.

HIGH-EXPANSION FOAM

When an underground fire cannot be directly attacked due to heat, smoke, or hazardous roof conditions, high-expansion foam may be one way to remotely quench the fire. Foam is a convenient means of conveying water to a fire. It suppresses/

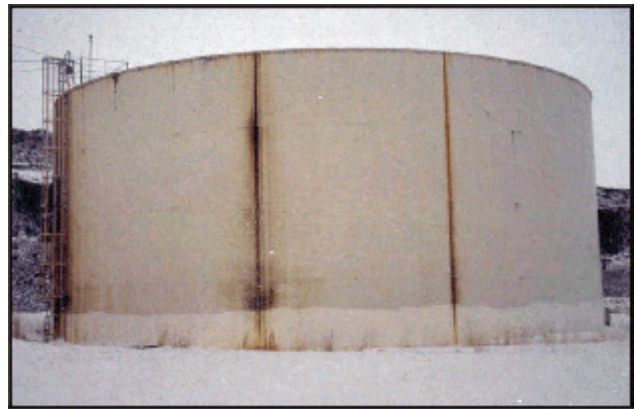


Figure 1.—1,000,000-gal surface water storage tank at an underground mine.



Figure 3.—Inspection of an underground fire hydrant.



Figure 4.—Underground storage of fire water hose in barrel.



Figure 2.—Measuring the throw distance of water hose.



Figure 5.—Underground storage of fire water hose in a rack.

extinguishes a fire by cooling the fire, diluting the oxygen concentration through the production of steam, and restricting air currents to the fire and radiant energy from the burning fuel. The foam can also reduce the spread of the fire by covering combustibles near the fire. Before a foam system is implemented, the mine operator should consider the training and resources needed to effectively use foam. Additional information on the use of foam for fighting underground coal mine fires can be found in the report by Conti [1994]. The MFPRC includes tables to record the various types of firefighting foam generators and foam concentrates on hand, including their locations, foam expansion ratio, and quantity of foam concentrates. Once the equipment and supplies are purchased, a plan must be developed for using foam in the mine. Figure 6 illustrates the building of a typical mine stopping for use with a foam generator. An inflatable feed-tube partition [Conti 1995; Conti et al. 1998a] interfaced with a high-expansion foam generator is shown in figure 7. Foam



Figure 6.—Erecting a typical mine stopping for a high-expansion foam generator.



Figure 7.—Inflatable feed-tube partition in the Lake Lynn Experimental Mine.

equipment should be compatible with the mine water system with regard to water quality, pressure, and fittings. When using foam or any other means of extinguishment, the mine operator should have an organized strategy for fast response and a group of well-trained miners ready for an emergency situation. The mine should also have periodic drills to test the effectiveness of the firefighting plan.

FIRE EXTINGUISHERS

Time is a critical factor when using a fire extinguisher in any fire situation. Two or three seconds can mean the difference between a successful fire extinguishment or disaster. Portable, multipurpose dry-chemical-type fire extinguishers are placed in strategic locations throughout the coal mine, such as working sections, electrical installations, oil storage stations, and on diesel-powered equipment. Extinguishers must be examined every 6 months to ensure that they have not been moved, are visible and accessible, have intact seals, and have no apparent damage or other obvious defects. Sometimes, because of an inadequate maintenance program or an inexperienced operator, a fire extinguisher fails to operate or to extinguish the fire.

A study to determine the reliability of dry-powder, hand-portable fire extinguishers in the mining industry was conducted by Allen Corp. of America for the USBM [Baker et al. 1981]. Of the 151 cartridge-type and stored-pressure-type extinguishers tested at underground coal mines, 18 (12%) failed to operate properly. The predominant failure causes were related to unreported discharging, improper maintenance, and neglect of environmental effects.

Extinguishers may not be handled until an emergency occurs; during this period, the dry chemical can settle and compact. This phenomenon is known as packing and is dependent on the particle size distribution of the dry-chemical agent. Packing will be more severe if the particle size difference is large and is most likely to occur if the extinguisher is stored vertically and subject to vibration. Caking occurs when the dry-chemical agent is contaminated by moisture. The moisture chemically reacts with the dry chemical and the individual particles adhere to each other, forming lumps. Caking and packing in dry-chemical extinguishers can affect performance. One recently visited coal mine had recurring problems with clogging of the elbow that connects the body of the extinguisher to the discharge hose.

Two types of dry-chemical fire extinguishers used underground are shown in figures 8 and 9. The MFPRC includes a table to identify the location and sizes of all fire extinguishers stored underground and on the surface. The table includes the total number and whether the extinguishers are hand-portable, wheeled, or skid-mounted. An essential element in any fire safety program is adequate hands-on training in the use and recharging of fire extinguishers.

In addition, rock dust is stored in bags, as shown in figures 10 and 11, at various underground locations to fight fires. It is important that the rock dust be protected from mois-

ture to prevent caking.



Figure 8.—Dry-chemical portable fire extinguisher mounted on the rib.



Figure 9.—Dry-chemical wheeled fire extinguisher.

FIRE STATIONS

Fire stations include cars, houses, trailers, boxes, and sleds that can transport personnel and equipment to the site of the fire. Figure 12 shows a fire trailer located on the surface of an underground coal mine. The stations must be easily transported to the fire area and be equipped with up-to-date firefighting equipment, tools, supplies, first-aid kits, and personal protective

equipment such as bunker gear, including self-contained breathing apparatus (SCBAs). The stations should be inspected regularly.



Figure 10.—Rock dust stored in plastic bags.



Figure 11.—Rock dust storage unprotected.



Figure 12.—Fire trailer located on the surface of an underground mine.

UTOMATIC FIRE DETECTION AND SUPPRESSION SYSTEMS

The early and reliable detection of underground fires is essential to ensure sufficient time to safely evacuate the miners and to extinguish the fire before it spreads. Temperature, carbon monoxide (CO), and smoke sensors can be used to detect underground coal mine fires. Smoke and CO sensors can detect a fire in its smoldering phase, before flames develop, depending on the production rate of smoke or CO by the smoldering fuel and the quantity of air flowing in the mine entry. The MFPRC includes a table to record the types of sensors used, their location, total number, spacing, and vertical position from the mine floor. Any problems with false or nuisance alarms are noted, and procedures for training personnel responsible for monitoring, testing, and calibrating the detection system are reviewed. A CO sensor mounted in an entry is shown in figure 13.

Automatic fire suppression systems used in underground coal mines include water deluge, water sprinkler, high-expansion foam, and dry-chemical. Figure 14 shows a sprinkler system mounted in a conveyor belt entry.

The MFPRC includes a table to record the type of system employed and its location. The procedures used to test and maintain the systems are reviewed. If water barriers (walls of water) are installed in mine entries, another table is provided to list their location, spacing, activation temperature, number of nozzles, and waterflow.

COAL AND OTHER COMBUSTIBLE MATERIALS

In an underground coal mine, the coal is virtually an unlimited fuel supply. The most serious mine fires occurred when the coal ignited and burned. The MFPRC addresses which



Figure 13.—CO fire sensor mounted in mine entry.



Figure 14.—Sprinkler system installed in mine entry.

coalbed is being mined and several coal characteristics that can influence its combustibility, including rank, volatility, and ash content. In general, coals of lower rank have a greater self-heating tendency; high-volatile coals spread flame more readily. Any occurrences of spontaneous combustion underground or on the surface in storage piles or silos are noted.

The mining operation requires the use and underground storage of combustible materials. These include fire-resistant conveyor belting, ventilation tubing, electrical cable, and brattice cloth, as well as oil and grease, diesel fuel, wood timbers, etc. It is important to realize that fire-resistant materials can ignite and burn. For example, fire-resistant conveyor belting has been shown to rapidly propagate flame and burn in large-scale tests [Lazzara and Perzak 1990] and in actual mine fires [Strahin et al. 1990]. The MFPRC includes tables to record the quantity and characteristics of the conveyor belting and other combustibles used and stored underground. For conveyor belting, the type (rubber or polyvinyl chloride), width, thickness, length, location, and MSHA fire-resistant approval number are recorded. The type, diameter, wall thickness, and MSHA fire-resistant approval number of rigid ventilation ducting are also noted. The total quantity of each combustible material, toxic hazard (low, medium, high) due to burning, and any special precautions beyond those required by Federal regulations are listed. An underground oil storage area is shown in figure 15; a trash storage area is shown in figure 16.

SELF-CONTAINED SELF-RESCUER

Federal regulations require that the mine operator make available to each miner and authorized visitors an approved self-rescuer device(s) that is adequate to protect a person for 1 hr or longer. The MFPRC addresses the type and model of the self-contained self-rescuer (SCSR) used at the mine, the number of units stored underground and on the surface and their locations, and how often SCSR refresher training is conducted. The procedures for inspecting the units for damage and removing units with expired service life are reviewed. Any problems that the mine has experienced with SCSRs are noted.



Figure 15.—Underground oil storage area.



Figure 16.—Improper storage of underground trash.

FIRST RESPONDERS, FIRE BRIGADES, AND MINE RESCUE

If a small fire is discovered by a miner with limited training in extinguishing fires, the fire may continue to grow before trained personnel arrive on the scene. First responders are the first persons to initiate firefighting. It is important that these miners be properly trained in the use of fire extinguishers and water hoses and in firefighting procedures. They should also know how to immediately and effectively communicate information about the emergency to other miners and key personnel so that they are aware of the situation.

Underground fire brigades or firefighters and mine rescue teams are important elements in any mine's emergency response plan. Fire brigades are composed of specially trained and equipped miners that work at the mine site and can rapidly respond to a fire. Mine operators most often rely on mine rescue teams to save lives during an underground emergency, such as a fire, explosion, roof fall, or water inundation. It is

extremely important that team members be provided with adequate exploration equipment and that training simulations⁷ be conducted in a realistic manner [Conti et al. 1998b; Conti and Weiss 1998; Conti et al. 1999]. Figure 17 shows rescue team members fighting a conveyor belt fire in the surface fire gallery at Lake Lynn Laboratory. The MFPRC examines the types of firefighting training conducted. A series of questions is also presented that deal with emergency response plans and duties for miners during firefighting and evacuation. Appendix C includes an example of an emergency response plan and a mine fire training program divided into three areas: basic fire training for all miners, intermediate fire training for mine fire brigades/mine rescue, and advanced training for fire brigades/mine rescue.

OTHER ISSUES

Other issues addressed by the MFPRC include ventilation, housekeeping, evacuation plans, and specialized equipment. Ventilation plans and ventilation training drills for various fires that could occur in the mine are addressed. The housekeeping section focuses on the removal and proper disposal of batteries, hazardous waste, and excessive coal dust accumulations. Under evacuation plans, the maintenance and identification of escapeways and how often miners walk the entire escapeway are discussed. The specialized equipment section deals with turnout gear, SCBAs, specialized fire warning systems, and motion sensors for firefighters and mine rescue teams.

GENERIC CHECKLISTS

Some mines have already developed extensive checklists and procedures on specific topics to improve their state of preparedness. MSHA reported that more than 20% of belt entry fires during 1970-88 were caused by welding/cutting operations [Luzik 1991]. To address this issue, some mines require a hot



Figure 17.—Mine rescue teams fighting a conveyor belt fire at Lake Lynn Laboratory.

work permit before any welding or cutting operations are done (see appendix B, “Cutting/Welding Permit,” examples 1 and 2). This permit requires certain safety checks before and after the planned maintenance activity. Each permit is monitored by a communications coordinator. Another way to decrease the probability of a fire in a conveyor belt drive area due to coal dust accumulations, defective equipment, etc., is to have beltline checklist inspections. The checklist requires the examiners to look for potential problem areas and available safety equipment. Some mines cover the total belt drive area (roof, ribs, and floor) with noncombustible material and hose down the area with water once per shift.

Appendix B contains 34 generic examples of checklists and safety procedures that can be used by a mine. These include procedures to conduct annual fire hydrant and fire hose checks; semiannual inspections of fire extinguishers and a monthly checklist for high-expansion foam generators; first-aid supplies for fire cars or safety trailers, and an emergency material skid; and functional tests of mine monitoring and fire suppression systems.

SUMMARY

Preparedness is an essential element of any underground mine's strategic plan in dealing with an unexpected fire. It is important that the fire be detected in the incipient stage and that well trained and fully equipped miners respond during that crucial period. Time is a critical factor, and any delay may mean serious injuries and the loss of the mine.

The NIOSH-developed underground coal mine fire preparedness and response checklist is a data collection instrument for determining both the fire prevention and re-

sponse near Fairchance, PA. Additionally, MSHA's National Mine Health and Safety Academy near Beckley, WV, provides training for first responders and mine rescue teams.

⁷Mine rescue team training is conducted at NIOSH-PRL's Safety Research Coal Mine at Bruceton, PA, and Lake Lynn Experimental Mine

capabilities at an underground coal mine. It encompasses conditions, procedures, and equipment that have frequently been the primary or contributing cause of underground coal mine fires. Areas that need to be strengthened are identified.

Current NIOSH research is aimed at further refinement and field testing of the MFPRC. A similar checklist for metal/non-metal mines is currently being developed. Mines participating in this study can have their strengths and weaknesses defined. In addition, there is less chance that problem areas might go undiscovered and not addressed. It also gives miners a chance to share their experiences and gain from the experiences of others. The checklist can also be used as a training aid for the mine, e.g., to show miners and new hires how to check water pressures at fire

MFPRC data, and the program would rate the effectiveness of their mine fire preparedness and response program. The highest anticipated rating would be attained by a mine that matched all or most of the requirements specified for a model mine by a group of experts. Recommendations to improve the state of preparedness would be listed.

hydrants or properly store and use a fire hose. The completed checklist gives the mine an instant picture of its fire preparedness and response capabilities. In a subsequent report, the data collected at the mines participating in this study will be analyzed.

An interactive computer program is also being considered for development. Mine personnel would enter the requested

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APPENDIX A.—NIOSH UNDERGROUND COAL MINE FIRE PREPAREDNESS AND RESPONSE CHECKLIST

(Please feel free to photocopy.)

WATER SUPPLY

All text within a bordered box throughout appendix A represents language from 30 CFR.

75.1100-1(a) - Waterlines shall be capable of delivering 50 gallons of water a minute at a nozzle pressure of 50 pounds per square inch.

75.1100-1(b) - A portable water car shall be of at least 1,000 gallons capacity and shall have at least 300 feet of fire hose with nozzles. A portable water car shall be capable of providing a flow through the hose of 50 gallons of water per minute at a nozzle pressure of 50 pounds per square inch.

75.1100-2(a) - Each working section shall be provided with two portable fire extinguishers and 240 pounds of rock dust in bags or other suitable containers; waterlines shall extend to each section loading point and be equipped with enough fire hose to reach each working face.

C Is there a map of the water system? Yes ____ No ____.

Where is the map located? _____
_____.

Who is the contact person? _____.

When was the map last updated? _____.

• Availability of mine water: Unlimited supply _____

Reservoir _____ Approximate gallons: _____.

Other source _____ Approximate gallons: _____.

• Do you have water cars? Yes ____ No ____.

If yes, what is the total number of water cars? _____.

Approximate gallons: _____.

- Quality of underground mine water:

Caustic _____ Acidic _____ pH level _____.

(A pH level >7 indicates caustic; <7 indicates acidic)

Hardness _____ mg/L (200 is normal for drinking water)

Total dissolved solids (TDS) _____ mg/L.

- If your water lines are in your beltline, please complete the following. If not, please explain:

Is waterflow and airflow in the same direction on *main water lines*?

Yes ____ No ____.

If no, what precautions are used if smoke is outby a fire and you need water for firefighting?

Is waterflow and airflow in the same direction on *branch water lines*?

Yes ____ No ____ Varies _____.

If no, what precautions are used if smoke is outby a fire and you need water for firefighting?

- Are safety valves (shutoff ball valves) supplied, for example, if line is broken? Yes ____ No ____

Spacing of valves _____.

- Location of main water pump stations: Underground ____ Surface ____ None ____.

If you have a main water pump station, indicate type:

Electrical ____ Diesel ____ Other ____.

- Type of backup systems: Pump ____ Water Supply ____ None ____.

If you have a pump-operated backup system, indicate type:

Electrical ____ Diesel ____ Other ____.

75.1100-2(b) - Belt conveyors. Waterlines shall be installed parallel to the entire length of belt conveyors and shall be equipped with firehose outlets with valves at 300-foot intervals along each belt conveyor and at the tailpieces. At least 500 feet of firehose with fittings suitable for connection with each belt conveyor waterline system shall be stored at strategic locations along the belt conveyor. Waterlines may be installed in entries adjacent to the conveyor entry belt as long as the outlets project into the belt conveyor entry.

75.1100-2(c) - Haulage trucks. Waterlines shall be equipped with outlet valves at intervals of not more than 500 feet, and 500 feet of firehose with fittings suitable for connection with such waterlines shall be provided at strategic locations. Two portable water cars, readily available, may be used in lieu of waterlines prescribed under this paragraph.

- What is the spacing of your water hydrants/fire taps/hose drops/etc.? ____ ft.

- Water hydrant size(s): ____ in.

Type of fitting: NST ____ Pipe ____ Other ____.

Approximate height of water hydrants from floor: ____ ft.

- Position of water hydrants outlet: Up ____ Down ____ Sideways ____ Varies ____.

NOTE: Water hydrant outlets, etc., positioned downward collect sediment and must be flushed before connecting water hoses.

Is the water pressure adjustable? Yes ____ No ____.

If yes, do you have a written procedure to adjust the water hydrant pressure?

Yes ____ No ____.

Type of valve(s) on water hydrant: ball valve _____ 10-turn valve _____

Other _____ Please explain: _____.

Can you use more than one hose at each manifold/hydrant?

Yes _____ No _____.

Please explain: _____.

- Are the locations of your water hydrants marked (examples: sign, painted rod)?

Yes _____ No _____.

Type of marking: _____.

Location of markings: Near roof _____ Center of entry _____ Other _____.

Do these markings vary throughout the mine? Yes _____ No _____.

- Are the water hydrants marked in adjacent entries? Yes _____ No _____.

If yes, how are they marked? _____.

Are the water hydrants accessible from adjacent entries? Yes _____ No _____.

- Approximately how much access room is there between rib and belt? (This is important when connecting water lines and evacuating in smoky conditions):

(Note: 24-in minimum requirement.)

Main - Clearance between tight side of belt and rib: _____ ft.

Clearance between wide side of belt and rib: _____ ft.

Section - Clearance between tight side of belt and rib: _____ ft.

Clearance between wide side of belt and rib: _____ ft.

75.1103-11 - Each fire hydrant shall be tested by opening to insure that it is in operating condition, and each fire hose shall be tested, at intervals not exceeding 1 year. A record of these tests shall be maintained at an appropriate location.

- Inspections are conducted every _____ months.

What are the procedures? _____

_____ .

Are functional tests performed? Yes ____ No ____.

If yes, how? _____

_____ .

Are written records maintained? Yes ____ No ____.

- Is water available in remote locations (areas not used)? Yes ____ No ____.

If yes, what is the water pressure and flow in these areas?

psig: ____ gpm: ____

If no, what method would be used to supply water to these locations?

Pipe ____ Hose ____ Size(s) _____ Other _____ .

What would be the expected water pressure in these locations? ____ psig.

- Can your compressed airline or any other pipe line (if you have them) be converted over to be used as water lines during an emergency (for example, water in remote areas or failure of existing water lines)? Yes ____
No ____.

If yes, how difficult or time-consuming is the conversion? _____

_____ .

Do you have a conversion kit for this purpose? Yes ____ No ____.

HOSES AND NOZZLES

75.1100-1(f)(1) - The fire hose shall be lined with a material having flame resistant qualities meeting requirements for hose in Bureau of Mines' Schedule 2G.

- What procedures are used to store fire water hose? _____

_____ .

Inspection intervals every _____ months.

What are the procedures? _____

_____ .

What is your procedure for damaged or deteriorated water hose (replaced/repaired)?

_____ .

Is testing according to NFPA 1962 Standard for the care, use, testing, and service of fire hose, including couplings and nozzles? Yes ____ No ____.

If no, what do you do? _____.

• Please complete the following table of fire nozzles:

FIRE NOZZLES

Total Number						Size, in	Thread, type	Pressure rating, psig
Expensive ¹		Inexpensive ²						
Surface	Under-ground	Surface		Underground				
		Brass	Plastic	Brass	Plastic			

¹Nozzle over \$200 and fully adjustable.

²Nozzle under \$50.

- Can foam nozzles be used with your water lines or fire hose? Yes ____ No ____.
- Do you have the capability of using foam eductors? Yes ____ No ____.
- If foam concentrate is stored on the surface, is it protected from extreme weather temperatures? Yes ____ No ____.
- Are the foam concentrate containers stacked according to the manufacturer's recommendations? Yes ____ No ____.
- Is the foam concentrate in closed containers? Yes ____ No ____.
- Do you inspect/test the foam concentrate? Yes ____ No ____.
- Is your foam concentrate compatible with your mine water supply? Yes ____ No ____.

If no, why? _____
 _____.

- Is your foam equipment compatible with foam concentrate? Yes ____ No ____.

If no, why? _____
 _____.

- Do you have trained people to use foam equipment? Yes ____ No ____.

When was the last time this equipment was tested? _____

 _____.

- If you have more than one brand of foam concentrate, have you tested the quality of foam production if brands are mixed?

Yes ____ No ____ Only one brand used ____.

If yes, what were the results? _____

- Have you tested the foam generators in your mine? Yes ____ No ____.

If yes, what problems did you experience, if any? _____

- For example, if you were using a diesel-powered, high-expansion foam generator in an upward sloping entry, what would you do to prevent the foam plug from rolling back over the foam generator?

Please explain: _____

- Do you have procedures for inspecting foam generators? Yes ____ No ____.

If yes, what are these procedures? _____

- Please complete the following table on foam concentrate:

FOAM CONCENTRATE

Foam type	Storage				Percent concentrate	Total amount, gal
	Surface	Unit	Underground	Unit		

If you run out of foam during an emergency, do you have a supplier? Yes ____ No ____.

- How long would it take to receive the foam? _____
_____.

FIRE EXTINGUISHERS

75.1100-3 - Condition and examination of firefighting equipment. All firefighting equipment shall be maintained in a usable and operative condition. Chemical extinguishers shall be examined every 6 months and the date of the examination shall be written on a permanent tag attached to the extinguisher.

- How often do you inspect fire extinguishers? Every ____ months.

What are the procedures? _____

_____.

- Are you aware that if a fire extinguisher is not handled for extended periods of time, the dry chemical can settle and compact?

Yes ____ No ____.

- Are you aware that caking occurs when moisture contacts the dry chemical due to faulty gaskets and rusty extinguishers?

Yes ____ No ____.

- Are hydrostatic test dates of fire extinguishers and pressure vessels checked?

Yes ____ No ____.

- Do you realize the hazards of rusty fire extinguishers and pressure vessels?

Yes ____ No ____.

What are they? _____

_____ .

- Do you have a plan to handle damaged, partially used, and rusty fire extinguishers?

Yes ____ No ____.

What is done with rusty fire extinguishers (repair/replace)? _____

_____ .

- Who removes defective extinguishers? _____

_____ .

How is this handled? _____

_____ .

- Are your employees trained to identify defective fire extinguishers? Yes ___ No___.
- Are fire extinguishers exposed to mud or wash plant overflows? Yes ___ No___.

If yes, how are they protected (example: shields, storage boxes)? _____

 _____.

75.1100-2(d) - *Transportation.* Each track or off-track locomotive, self-propelled mantrip car, or personnel carrier shall be equipped with one portable fire extinguisher.

75.1100-2(e)(1) - *Electrical installations.* Two portable fire extinguishers or one extinguisher having at least twice the minimum capacity specified for a portable fire extinguisher in 75.1100-1(e) shall be provided at each permanent electrical installation [greater than 6 months].

75.1100-2(e)(2) - *Electrical installations.* One portable fire extinguisher and 240 pounds of rock dust shall be provided at each temporary electrical installation [less than 6 months].

75.1100-2(g) - *Welding, cutting, soldering.* One portable fire extinguisher or 240 pounds of rock dust shall be provided at locations where welding, cutting, or soldering with arc or flame is being done.

- Are you prepared for on-site recharge of fire extinguishers? Yes ___ No___.

If yes, what is the number of on-site trained people to recharge fire extinguishers?_____.

Quantity of charged cartridges: _____

Dry-chemical powder _____ lb.

If no, what is the timeframe for acquiring new fire extinguishers or having an

outside contractor recharge them? _____

 _____.

- How do you protect rock dust stored underground from moisture? _____

FIRE STATIONS

(Fire stations include cars, houses, trailers, boxes, foam generator trailers, sleds, etc.)

75.1101-23(a)(1)(ii) - Rapid assembly and transportation of necessary men, fire suppression equipment, and rescue apparatus to the scene of the fire.
75.1100-2(i) - *Emergency materials.*
75.1713-7 - First-aid equipment; location; minimum requirements.

• Total number of fire stations: _____.

Locations: Underground _____ Surface _____.

Are the stations easily transported to the fire area? Yes ____ No ____.

If no, why? _____

How are they transported? _____

_____.

Do they require special handling or components, like hitches?

Yes ____ No ____.

What are the special handling requirements? _____

_____.

- Is the station equipped with a pager phone and extra wire? Yes ____ No ____.
- Do you have an up-to-date plastic laminated mine map with grease pencils located on the station?
Yes ____ No ____.
- Some mines utilize fire hose in various sizes (1.5- to 2.5-in-diam) or a lightweight high- volume (5- to 6-in-diam) nonpolarized hose fitting. What size hose do you use on your station? _____

_____.
- A portable hose clamp is used to temporarily stop the waterflow in hoses to reduce delays caused by turning the main water supply on or off if problems are encountered. Do you have a hose clamp on your station?
Yes ____ No ____.
- Spanner wrenches are used to detach fire hoses and fittings (the wrenches are small and easily lost, so several wrenches should be available). Do you provide spanner wrenches on your station?
Yes ____ No ____.
- Do you provide special hose nozzles that are suitable for firefighters and are appropriate to use with the mine water pressure and equipment? Yes ____ No ____.
- Are booster pumps provided on the station to raise water pressure? Yes ____ No ____.
If yes, enter the total number in the following categories:
Diesel _____ Electric _____ Other _____.
- Are regulators provided on the station to lower the water pressure? Yes ____ No ____.

- Is firefighting foam equipment and a supply of foam concentrate available on the station?

Yes ____ No ____.

- Type of foam equipment stored on the station? _____

_____.

How much foam concentrate is stored on the station? _____.

Where do you go if you run out of foam concentrate during an emergency? _____

_____.

How long would it take to retrieve it? _____.

- Are portable fire extinguishers available? Yes ____ No ____.

- Is a supply of dry-chemical agent with replacement gas cartridges available?

Yes ____ No ____.

Please explain: _____

_____.

- Are wheeled or skid-mounted fire extinguishers provided on the station? Yes ____ No ____.

Please explain: _____

_____.

_____.

- Are various tools and supplies provided on these trailers/fire cars? Yes ____ No ____.

What kinds of tools and supplies? _____

_____.

- Roof jacks may be necessary for temporary roof support. Are they provided on the stations? Yes ____ No ____.
- Hydraulic pump jacks may be necessary to lift heavy objects. Are they provided on the station? Yes ____ No ____.
- Are first-aid kits to treat minor burns and injuries provided? Yes ____ No ____.

Please explain: _____
_____.

Personal Protective Equipment (PPE)

- Is personal protective clothing available for firefighters on the station? Yes ____ No ____.
- Number of SCBAs (*not* SCSRs) provided on the station: _____.

Miscellaneous

- Total amount of rock dust provided on the station: _____.

Is the rock dust protected from moisture? Yes ____ No ____ Sometimes ____.

Please explain: _____
_____.

- Does everyone know the location of these stations and procedures to be followed when moving to fire location?
Yes ____ No ____.

Please explain: _____
_____.

- Who is responsible for inspecting, maintaining, and using the stations? _____
_____.

How often is this inspection conducted? _____.

What constitutes an inspection? _____

Are records/logs kept? Yes ____ No ____.

Location of records: _____

DETECTION SYSTEMS

75.1103-1 - Automatic fire sensors. A fire sensor system shall be installed on each underground belt conveyor. Sensors so installed shall be of a type which will (a) give warning automatically when a fire occurs on or near such belt; (b) provide both audible and visual signals that permit rapid location of the fire.

FIRE SENSORS

Sensor type	Location	Total number	Spacing, ft	Vertical position from floor, ft

- What is the CO background level if using diesel equipment? _____ ppm.
- Manufacturer of CO system? _____

Warning level _____ ppm Alarm level _____ ppm.

• Manufacturer of thermal system? _____.

Alarm level: _____EF

• Manufacturer of smoke sensor: _____.

• Manufacturer of diesel-discriminating sensor: _____.

• Is there battery backup in case of electrical failure? Yes ____ No ____.

If yes, how much time?_____.

• Are there any unusual problems with the fire sensors? Yes ____ No ____.

Please explain: _____

_____.

• Do you have a problem with *false* or *nuisance* fire alarms? Yes ____ No ____.

What is the frequency (number of false alarms per month)? _____

_____.

Where is the location of false alarms? _____.

What is the cause of false alarms? _____

_____.

• Do you have a hot work permit (welding/cutting)? Yes ____ No ____.

Please explain: _____

_____.

• Location of monitoring room? Aboveground _____
_____.

Other: _____
_____.

• Is the person in monitoring room trained in proper response to sensor alerts and alarms?

Yes ____ No ____ . What is the training? _____

_____.

• Is there a procedure for checking wire continuity, sensor function, cable clearance around moving machinery, etc.?

Yes ____ No ____.

• Are these wires/cables redirected around areas that have a high potential for fire (for example, drives, brake stations, etc.)? Yes ____ No ____.

Please explain: _____
_____.

• Is the sensory element of the fire sensor oriented into the airflow (this is critical with only certain brands of sensors)?

Yes ____ No ____ Varies ____.

• Are there any moisture, electrical, or other problems with the sensors? Yes ____ No ____.

Please explain: _____
_____.

75.1103-8 - Automatic fire sensor and warning device systems; inspection and test requirements.

- What are the intervals of functional tests (a complete test of the system from underground sensor to surface computer)? _____.
- What are the calibration intervals? _____.
- What kind of general training is provided for individuals who handle, install, and calibrate fire sensors?

_____.
- What kind of training is provided, in general, to better acquaint all miners in the day-to-day operation of fire sensors (for example, better communications when using equipment near sensors, welding/cutting operations, diesel equipment, etc.)?
Please explain: _____

_____.
- What is the procedure to be followed if a miner smells or sees smoke underground? _____

_____.

• What kind of underground communication system do you have? _____

_____.

Where are the phone lines located? _____

_____.

Are phones and other communication cables protected from areas prone to fires?

Yes ____ No ____.

Please explain: _____

_____.

• Do you have a specialized fire warning alarm system to alert all miners of an emergency?

Yes ____ No ____.

Please explain: _____

_____.

SUPPRESSION SYSTEMS

- 75.1101-1 - Deluge-type water spray systems.**
- 75.1101-5 - Installation of foam generator systems.**
- 75.1101-6 - Water sprinkler systems; general.**
- 75.1101-13 - Dry powder chemical systems; general.**

• Are functional tests of suppression systems performed? Yes ____ No ____.

• Do you follow a checklist? Yes ____ No ____.

What is the procedure? _____

_____.

Are records/logs kept? Yes ____ No ____.

How often are suppression systems checked? _____.

- Please complete the following table on suppression systems.

SUPPRESSION SYSTEMS UNDERGROUND

Location	Water deluge	High-expansion foam	Dry-chemical	Water sprinkler

- When the water sprinkler system is activated, will the water spray cover the entire cross-section of the entry? Yes _____ No _____.

- Are water sprinkler heads changed? Yes _____ No _____.

If yes, what is the time period? _____.

- Are shutoff valves normally left open? Yes _____ No _____.

How do you ensure that the shutoff valves are open, and if they were closed during a fire, could they be opened?

Please comment: _____

_____.

- How do you protect your water from freezing? _____

_____.

- Who is responsible for maintaining the suppression systems? _____

_____.

What are the procedures? _____

_____.

Are records/logs kept? Yes ____ No ____.

- Do you utilize water barriers (wall of water)? Yes ____ No ____.

If yes, please complete the following table on water barriers (wall of water).

WATER BARRIERS (WALL OF WATER)

Location	Spacing interval	No. of spray nozzles per cross-section	Activation temperature, °F	Waterflow, gpm

- If water barriers (wall of water) are located in the belt entry, are they positioned in the middle of the block? Yes ____ No ____ N/A ____.

- Do you utilize water lances (pipe with water sprays that can be inserted through stoppings or doors downwind of a fire)? Yes ____ No ____.

Please explain: _____

_____.

VENTILATION

• Is your mine fan a blowing or exhausting fan? _____.

• Can you reverse the direction of your fan? Yes ____ No ____.

If no, could it be modified during an emergency? Please explain: _____

_____.

Ⓒ Do you have a ventilation plan for various fire scenarios that could occur in your mine?

Yes ____ No ____ Please explain: _____

_____.

Ⓒ How many people are familiar with the ventilation plan? _____.

Please explain: _____

_____.

Do miners on each section know where the air comes from and where the air goes (for example, location of fans, ventilation materials, etc.)? Yes ____ No ____.

Ⓒ Do you conduct training exercises to show how to ventilate (for example, battery fire, belt fire)?

Yes ____ No ____.

Please explain: _____

_____.

Do all miners participate in these drills? Yes ____ No ____.

Ⓒ Do you isolate your haulage road from the beltline? Yes ____ No ____.

Ⓒ Would you split your intake air before inby miners are out of the mine during a fire?

Yes ____ No ____.

Please explain: _____
_____ .

C Is someone knowledgeable about the mine's ventilation system if changes are to be made (for example, where to dump the air)? Yes ____ No ____.

Please explain: _____
_____ .

C Do all workers understand their role in implementing the fire ventilation plan if there is a fire in their section? Yes ____ No ____.

Please explain: _____
_____ .

• Is each section provided with a one-page write-up (bullet form) on how to respond to inby and outby fires (for example, procedures to be followed for an inby belt fire)? Yes ____ No ____.

Please explain: _____
_____ .

• What is the clearance between the floor and the bottom of conveyor belting? _____

• If ventilation tubing is used, what is the MSHA approval number? _____.

What is the diameter? _____ in.

What is the thickness? _____ in.

Type _____.

What is the total length used underground? _____ ft.

• Do you use meshing for roof and rib control? Yes ____ No ____.

Wire mesh____ Plastic mesh____. If plastic, approximate square feet _____.

C Do you use plastic resin roof bolts? Yes _____ No _____.

- Please complete the following table on combustible materials stored or used underground:

COMBUSTIBLE MATERIALS STORED OR USED UNDERGROUND

Material	Quantity	Unit	Toxic level due to burning			Special precautions (above and beyond MSHA regulations)	
			Low	Medium	High	Fires	Explosions
Brattice							
Conveyor belting							
Diesel fuel (storage and vehicles)							
Electrical cables							
Fluids (emulsion)							
Fluids (hydraulic)							
Grouting							
Oils							
Plastic piping							
Roof bolt resins							
Lumber (untreated)							
Lumber (treated)							
Tires (on equipment)							
Ventilation tubing							
Oxygen							
Acetylene							
Propane							

HOUSEKEEPING

- Do you have any surface hazards that can affect the underground mine (for example, propane storage tanks)? Yes

____ No ____.

Please list: _____

_____.

- Ⓒ Do you store compressed gas cylinders underground? Yes ____ No ____.

If yes, how and where do you store compressed gas cylinders? _____

_____.

- Ⓒ Do you have a battery disposal program? If yes, please explain: _____

_____.

- Ⓒ Are old batteries removed from the underground mine? Yes ____ No ____.

- How do you handle hazardous waste, such as antifreeze, emulsion oil, etc.? _____

_____.

- How do you handle underground fuel spills (for example, diesel fuel)? _____

_____.

• What is done with underground trash? _____
_____.

• Are your crosscuts, with manddoors, free of obstructions, such as mine materials, equipment, etc.?

Yes ____ No ____.

Please explain: _____
_____.

• Are your crosscuts or areas used to store emergency equipment free of obstructions?

Yes ____ No ____.

Please explain: _____
_____.

• Do miners have an oppportunity to assess their work area and personal protective equipment?

Yes ____ No ____.

Please explain: _____

_____.

• How do you control the buildup of excess coal dust on beltlines? _____
_____.

• What procedures are used to inspect and dispose of residue from belt and V-plow scrappers? _____

_____.

How many belt scrapers do you have underground? _____.

How many V-plow scrapers do you have underground? _____.

- What procedures are used to reduce belt thread buildup? _____
_____.
- Are your belt drive areas covered with a noncombustible material? Yes ____ No ____.
- Are your power center areas covered with a noncombustible material? Yes ____ No ____.
- Are your charging station areas covered with a noncombustible material? Yes ____ No ____.
- What is done to control the caking of rock dust and coal dust on sprinkler heads? _____

_____.

EVACUATION PLANS

75.380 - Escapeways; bituminous and lignite mines.

75.384 - Longwall and shortwall travelways.

75.1101-23(a) - Each operator of an underground coal mine shall adopt a program for the instruction of all miners in the location and use of fire fighting equipment, location of escapeways, exits, and routes of travel to the surface, and proper evacuation procedures to be followed in the event of an emergency.

- Do you incorporate your evacuation plan in your drills? Yes____ No ____.

Please explain: _____
_____.

- How often do miners walk the escapeway? _____
_____.

Do miners walk the entire escapeway or just part of the way? _____
_____.

- How much time is required to walk the escapeway from the section to the portal?

_____.

- How do you maintain your escapeways?

Please explain: _____
_____.

- How are your escape routes identified? _____.

Are they identifiable in smoke? Yes ____ No ____.

Please explain: _____
_____.

SELF-CONTAINED SELF-RESCUERS (SCSRs)

75.1714(a) - Each operator shall make available to each miner who goes underground, and to visitors authorized to enter the mine by the operator, an approved self-rescue device or devices which is adequate to protect such person for 1 hour or longer.

- What brand and model of SCSR is used at the mine? (If more than one type, please list all.)

_____.

C How often is refresher training conducted? _____.

- How many SCSRs are stored underground?

Total number: _____ MSA _____ CSE _____ Ocenco _____

Draeger _____ Other _____

Where are your underground SCSR caches located? _____
_____ .

- How many SCSRs are stored on the surface?

Total number: _____ MSA _____ CSE _____ Ocenco _____
Draeger _____ Other _____

C How are SCSRs with *expired service life* removed from service?

Please explain: _____
_____ .

What is done with these units? _____
_____ .

Are records/logs kept of these units? Yes _____ No _____.

Please explain: _____
_____ .

Are serial numbers recorded? Yes _____ No _____.

C How are these units tracked after they are taken underground?

Please explain: _____
_____ .

C Are units visually inspected for damage? Yes _____ No _____.

How often? _____

Who inspects them? Please explain: _____

_____ .

C What is done with damaged units? _____

_____.

Are records kept of inspections and removal of damaged units? Yes ____ No ____.

C Does your mine participate in NIOSH's Long-Term Field Evaluation Program?

Yes ____ No ____.

Date of last replacement: _____.

Total number of units replaced: _____.

C Has your mine experienced any problems with SCSRs? Yes ____ No ____.

Please explain: _____
_____.

FIRST RESPONDERS TO FIRE¹

75.1101-23 - Program of instruction; location and use of fire fighting equipment; location of escapeways, exits and routes of travel; evacuation procedures; fire drills.

• How often are fire drills conducted? _____
_____.

• What kind of training is conducted for miners responding to a fire? _____

_____.

¹First responders are the first persons to initiate firefighting.

- Who conducts training? _____
_____.

If outside vendor/consultant, please list: _____
_____.

- What kind of firefighting equipment is used in training?

Extinguishers____ Fire hose____ Fire suppression systems____

Foam generators____ Other (please explain) _____.

- During training, are real fires extinguished? Yes ____ No ____.

If yes, describe fire scenario: _____
_____.

- How often is fire training conducted? _____
_____.

- Is smoke training conducted? Yes ____ No ____.

If yes, describe scenario: _____

_____.

Type of apparatus used: _____
_____.

- What type of training is conducted for SCSRs or filter self-rescuers? _____

_____.

- Do miners have specific duties if there is a fire on their section? Yes ____ No ____.

If yes, what are their duties for the section? _____

_____.

What are their duties if they are outby? _____
_____.

- What percentage of miners are trained in first aid? ____ %.
- Do you have a standard operating procedure (SOP) for first person to respond to a fire?

Yes ____ No ____.

Please explain: _____
_____.

How many miners are trained overall? _____.

- How many per section? _____.
- Do you have an agreement for assistance from the local fire department, for example, fighting surface fires or the use of fire hose and water? Yes ____ No ____.

What precautions are taken (on-site training, liability)? _____

_____.

- Do you have a mutual agreement with other mines to fight fires? Yes ____ No ____.

If yes, do you train together, etc.? Yes ____ No ____.

Please explain: _____
_____.

FIRE BRIGADES

C Do you have a fire brigade? Yes____ No____. (If no, skip this section.)

- How many teams do you have?_____.

How many members per team? _____.

- How are members selected? _____
_____.

- What are the criteria for being on the fire brigade? _____

_____.

- How often do fire brigade members train?

Describe training: _____

_____.

- Do fire brigade members train with the mine rescue team members? Yes ____ No ____.

- Do you provide your fire brigade with specialized equipment? Yes ____ No ____.

Please explain: _____
_____.

- How much time is required for the fire brigade team to muster and respond to an underground fire?

_____.

This amount of time depends on what? _____
_____.

- Do you have an SOP for the fire brigade? Yes ____ No ____.

Please explain: _____

_____.

- Has your team ever participated in an actual mine emergency? Yes ____ No ____.

Please explain: _____
_____.

MINE RESCUE

49.2 - Availability of mine rescue teams.

- If you have mine rescue teams, how many teams do you have? _____.

How many members per team?_____ How many members per shift? _____.

Ⓒ If you do not have a team, how are you covered? _____.

- What are the criteria for being on the mine rescue team? _____

_____.

- How often do mine rescue team members train? _____
_____.

Describe training: _____

_____.

- If you have more than one team, is cross-training provided? Yes ___ No ___ N/A ___.
- Has your team ever trained with your State mine rescue teams? Yes ___ No ___.
- Do mine rescue team members train with the fire brigade members? Yes ___ No ___.
- Do you provide your mine rescue team with specialized equipment? Yes ___ No ___.

Please explain: _____
_____.

- How much time is required for the mine rescue team to muster and respond to an underground fire?
_____.

- Do you have an SOP for mine rescue? Yes ___ No ___.

Please explain: _____
_____.

- Has your team ever participated in an actual mine emergency? Yes ___ No ___.

Please explain: _____

_____.

SPECIALIZED EQUIPMENT

- What type of turnout gear do you have? _____
_____.

Total number: _____ Where are they stored? _____
_____.

Do personnel have easy access to it? Yes ____ No ____.

- What types of SCBAs do you have? _____
_____.

Please enter the total number of units:

30-min _____ 60-min _____ 4-hr _____ Other _____

Location: _____
_____.

Explain your SCBA preventive maintenance program: _____

_____.

Are records/logs kept? Yes ____ No ____.

Ⓒ Do you have extra tanks of air? Yes ____ No ____.

- Do you have the capabilities of charging your own tanks? Yes ____ No ____.

If yes, is your system a cascading system? Yes ____ No ____.

- Do you provide motion sensors for team members? Yes ____ No ____.

- Do you have infrared devices or thermal imaging cameras for locating hot spots, fires, or missing miners? Yes ____ No ____.

Please explain: _____
_____.

• What is your team's communication system? _____

_____.

• Other comments: _____

_____.

**APPENDIX B.—EXAMPLES OF INSPECTION, MAINTENANCE, AND GENERAL
HOUSEKEEPING CHECKLISTS AND PROCEDURES**

ANNUAL HYDRANT CHECKS

30 CFR 75.1103-11

1. Checked with Conflow fire hydrant setting bend:
 - a. Unlock the presetting dome by loosening the three set screws with an Allen wrench. Rotate presetting dome by hand in a clockwise direction all the way out.
2. Connect the presetting bend onto the hydrant outlet using a 1.5-in pipe thread to NST thread adapter.
3. Use the 0.5-in presetting bend nozzle.
4. Use caution when applying pressure flow through the 0.5-in nozzle. Hold the nozzle tightly, directing the waterflow in a harmless direction so as not to hurt yourself or someone in the area or to cause damage to equipment.
5. Open the hydrant with the handwheel until the flow gauge is registering 120 psig.
6. Rotate the presetting dome by hand in an anticlockwise direction until it can move no further.
7. Lock the presetting dome in this position by tightening the three set screws.
8. Double-check the psi setting by opening the handwheel as far as possible; the flow gauge should read 120 psi.
9. Remove the presetting bend and adapter from the hydrant and replace hydrant cap.
10. Punch tag in proper place.

ANNUAL FIRE HOSE CHECKS

30 CFR 75.1103-11

1. Designated fire hose storage area consists of the following:
 - a. Ten 50-ft hoses are donut-rolled and placed in a blue 55-gal plastic barrel with two pogo poles taped with red and white reflective tape. There is a white sign with red reflective letters stating “fire hose.”
 - b. Two brass fire hose nozzles screwed on a gated Y are placed on top of the hoses, which are stored in the barrel.
2. Hose spacing
 - a. Main north travelway - every 1,000 ft.
 - b. Panel section - every 2,000 ft or less, in an X-cut on the belt side of No. 2 entry. If muddy or wet conditions exist on the belt side, the hose is placed on the uphill side. Both sides are on intake air.
 - c. If a belt drive is between this 2,000-ft spacing, then another barrel of hose is placed there.
3. Hose testing
 - a. Every hose is pulled out of the rack or reel and checked for leaks. If a hose is found to have any kind of leak, even a pinhole, the hose is replaced (cut both ends off of hose and discard).
 - b. The 50-ft hoses have a pressure check of 400 psi. To obtain that kind of pressure, a direct hookup to the water line is used. A gated valve and pipe with a pressure gauge are connected to the gated Y where the hoses are hooked up and laid out for testing. The hoses are laid out flat and the nozzles are opened slightly to prevent a water hammer. The water is turned on and the nozzles are closed after water flows through the nozzles. The water has pressure readings of 400 psi, and the water is left on for 2 min to check for leaks. The rating on the 100-ft hose found in some safety trailers is 250 psi; that is the pressure at which they are checked.

MONTHLY CHECKS ON FOAM GENERATOR

In a toolbox on the foam generator, there is a notebook that contains a complete listing of various items that should be on the generator. There are also a series of tests and checks to be made. After completing the inventory list and making the necessary series of checks and tests, the person that does these checks signs his or her name and states if anything is missing or wrong with the generator. If anything is missing or wrong with the generator, it must be reported to management and corrected immediately.

Items on, or tests to be made on, foam generator.

- | | |
|--|--|
| 1. Check oil | 19. Eight pogo sticks |
| 2. Check fuel | 20. Two sand bags |
| 3. Start generator | 21. One diesel can, 2.5 gal full |
| 4. Check cage (for dents, punctures, etc.) | 22. One can spads |
| 5. Check tires | 23. One can buttons |
| 6. Wheel chocks (3) | 24. One 4-ft spad gun |
| 7. Six 2.5-in red rubber hoses | 25. One 6-ft ladder |
| 8. Seven 1.5-in cloth hoses | 26. One bow saw |
| 9. Fifteen 3-in cloth (400-psi) hoses in racks | 27. Two shovels (one spade, one blunt end) |
| 10. One crank handle for starting the engine | 28. One pick |
| 11. One pressure reducer valve | 30. Four rolls brattice cloth |
| 12. One gang valve | 31. Two telephones (test system) |
| 13. One hose clamp | 32. One 8-lb sledge hammer |
| 14. Two bull hoses | 33. One hitch |
| 15. One fire extinguisher | 34. Approximately 300 ft telephone cable |
| 16. Two 30-gal barrels of foam concentrate | 35. Extracrank handle mounted on side of hose rack |
| 17. Ax | |
| 18. Eight 4-in Vic couplers | |

Items in tool box:

- | | |
|--|---|
| 1. Three 24-in pipe wrenches | 14. One 460 channel lock pliers |
| 2. One 18-in pipe wrench | 15. Two 2.5-lb hammers |
| 3. Two 0.5-in drive ratchets | 16. One claw hammer |
| 4. Two 1-1/16-in (0.5-in drive) sockets | 17. Three 6-in Vic couplers |
| 5. One wire brush | 18. One 2-in Vic couplers |
| 6. Two Akron nozzles | 19. One 1.25-in (0.5-in drive) socket |
| 7. Various nozzles, fittings, and couplers | 20. One 6- to 4-in Vic reducer |
| 8. Foam generator instruction manual | 21. One extra bow saw blade |
| 9. Two 12-in crescent wrenches | 22. One funnel and 1-in hose |
| 10. One 8-in crescent wrench | 23. Functional test overhead door (manual and electrical) |
| 11. One 6-in crescent wrench | 24. Annually drain and refill fuel tank and diesel can |
| 12. One spanner wrench | |
| 13. One set Allen wrenches | |

LOCATION: _____

DATE: _____

EXAMINER: _____

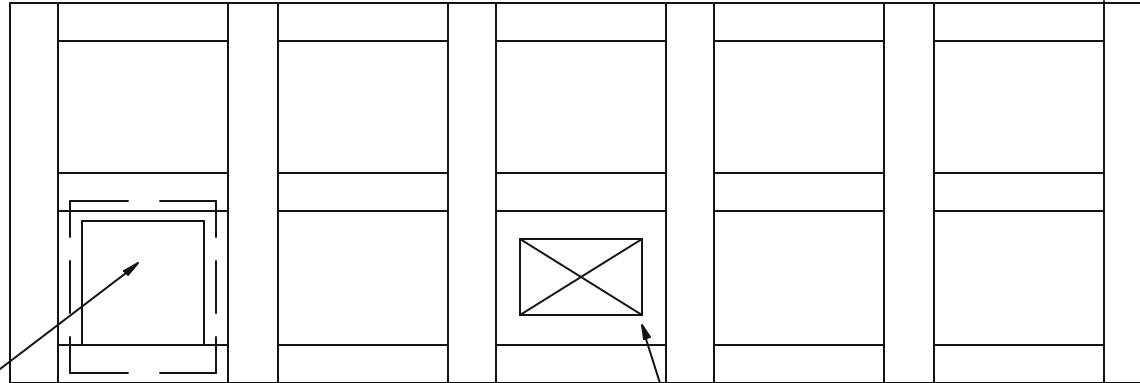
FOAM GENERATOR TESTING PROCEDURES

- | | |
|---|----------------------|
| 1. Measure line pressure at manifold
(should be between 114 and 200 psi) | _____ |
| | (pressure) |
| 2. Set inductor into 5 gal of fresh water
(should have tapered end with screen) | _____ |
| | (check) |
| 3. Check foam inductor setting to ensure that it is
locked into position 1
(other settings for different foam,
not for different flow characteristics) | _____ |
| | (setting) |
| | _____ |
| | (locked in position) |
| 4. Start generator by simulating short circuit | _____ |
| | (check) |

BRATTICE CURTAIN FOR FOAM GENERATOR

NAIL CURTAIN ON INBY SIDE
OF FRAMING

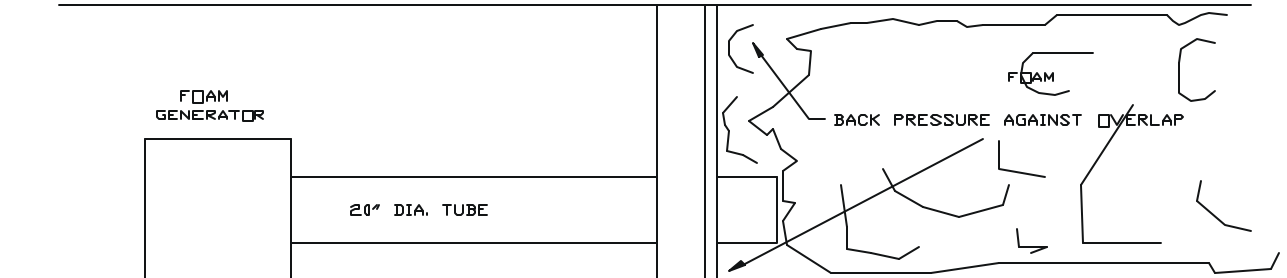
SET POSTS ON 4 FT CENTERS ACROSS ENTRY
NAIL BOARDS TO POSTS



CUT ACCESS HATCH IN CURTAIN MATERIAL
CUT FLAP TO OVERLAP HATCH 1 FT ON ALL SIDES
PUT FLAP ON INBY SIDE

MARK 20' X 20' SQUARE FOR FOAM TUBE
CUT DIAGONAL ACROSS CORNER

OVERLAP MIN. 1 FT CURTAIN MATERIAL ON ROOF, FLOOR & RIBS



6-MONTH FIRE EXTINGUISHER INSPECTION

30 CFR 75.1100-3

1. Visual inspection
 - a. Check for dents, rust, corrosion, welds.
 - b. Check indicator button. If it is up, you must discharge any remaining pressure in a safe direction.
2. Remove CO₂ cartridge - weigh (must be within 0.25 oz of stamped weight).
3. Check rubber washer in CO₂ cartridge seat. It must be intact and without cracks.
4. Check seal on CO₂ cartridge, and make sure that it is not punctured.
5. Work puncture device to ensure smooth operation.
6. Open lid on cylinder and make sure that there is adequate chemical.
 - a. Add chemical, if necessary.
 - b. Work red indicator button up and down to ensure that it works properly.
 - c. Make sure rubber seal is in place on underside of lid.
7. Activate hose handle. Some chemical should come out of hose. If not, turn unit upside down and loosen chemical by pounding unit on cap board.
8. Once these steps are taken and everything checks out:
 - a. Place red tie around hose and through pin, tie a knot, and clamp on white Ansul clip.
 - b. Punch metal tag in appropriate spot. If tag is used up or missing, replace with a new one.
9. Then enter extinguisher number on the list, fill in appropriate date and location. Also, initial each row that you do.
10. If extinguisher has been discharged, it is immediately removed from service from that area and another fresh checked extinguisher will be placed there. The discharged extinguisher is taken outside to the foam generator where the hose is disconnected from the extinguisher and blown completely out by compressed air. The monoammonium phosphate is replaced, and a complete check is done on the extinguisher as stated above.

EXTINGUISHER MOUNTING LOCATIONS

<i>Equipment</i>	<i>Location</i>
Track jeeps	On floor, trolley side between seats
Diesel mantrips - 6 man	Inside cab right side of transmission shifter
- 8 man	Operator side rear fender well
- 4 man	Inside cab right side of transmission shifter
Diesel trucks	Mounted to cab behind driver
Tugs	Left inside cab support leg in front of operator seat
Battery scoop	Operator side rear cubbyhole
Shield haulers	Left inside cab support leg in front of driver seat
Diesel scoop	Left inside cab support leg in front of driver seat
Diesel duster	Left inside cab support leg in front of driver seat
New style service center	Operator side behind cab mounted to grid steel
Old style service center	Cap support driver side front fender
Propane carts	Right-hand side opposite tank
Oxygen-acetylene carts	Back side of axle housing (horizontally)
Track roadmotors	Right inside rear wall of cab

NOTE: Bracket No. 40-03-0185

TRAILER-MOUNTED ANSUL 150C FIRE EXTINGUISHERS

1. Location:
 - a. Main North travelway between No. 2 and No. 3 entry at 46 and 61 crosscut and in No. 4 entry on MS travelway at 20 crosscut.
 - b. Surface locations: tipple, weld shop, between shop and compressor, and extras east of light-duty b
2. Consist of:
 - a. One cylinder holding 125 lb of Foray multipurpose dry-chemical agent
 - b. One nitrogen bottle
 - c. Hose with nozzle
 - d. One hitch used to move unit where needed

FIRST-AID SUPPLIES (EXAMPLE 1)

FIRST-AID BOX CHECKLIST

Location _____ Date _____ Names _____

	Minimum quantity	Quantity needed
1-in by 3-in Band Aid	50 each	_____
Fingertip Band Aid	50 each	_____
Knuckle Band Aid	50 each	_____
2-in by 2-in bandage	8 (2 boxes)	_____
4-in by 4-in bandage	8 (8 boxes)	_____
24-in by 72-in bandage	1 each	_____
4-in by 6-yd dressing	1 each	_____
Triangular bandage	15 each	_____
Tourniquet	2 each	_____
Burn compound	1 box	_____
Ammonia inhalants	1 box	_____
Merthiolate	1 box	_____
Eye wash	2 boxes	_____
Ice pack	2 each	_____
Scissors	1 pair	_____
Tape	1 roll	_____
Disposable exam glove	2 each	_____
Folding stretcher	1 each	_____
Folding back board	1 each	_____
Spider straps	1 set	_____
Woolen blanket	2 each	_____
Disposable blanket	1 each	_____
Sam splints	2 each	_____
Board splints	1 set	_____
Air splints		
Full arm	2 each	_____
Full leg zippered	1 each	_____
Half leg zippered	1 each	_____
Sager traction splint	1 each	_____
Oral airway	1 set	_____
Non-rebreathing mask	1 each	_____
Pocket mask	1 each	_____
Oxygen mask	1 each	_____
Oxygen bottle/regulator/wrench	1 each	_____

Stiff neck collars

- Short 1 each
- Regular 1 each
- Tall 1 each
- No-neck 1 each
- Soft neck collars 1 each
- BP cuff 1 each
- Stethoscope 1 each
- Glucose 1 each

FIRST-AID SUPPLIES (EXAMPLE 2)

NOTICE

To help keep the large first-aid box adequately supplied at all times, we ask that you please obtain basic first supplies from this small first-aid box. Below is a “minimum quantity” list of the supplies contained in this first-aid box. You may wish to add additional items. Please feel free to do so. If this box becomes depleted, please bring it to the safety/facility technicians, who will either refill or replace.

SMALL FIRST-AID BOX SUPPLY LIST

<i>Item</i>	<i>Minimum quantity</i>	<i>Item</i>	<i>Minimum quantity</i>
1-in by 3-in Bandits	50 each	Burn compound (Folie)	1 box
Fingertip Bandits	50 each	Merthiolate	1 box
Knuckle Bandits	50 each	Eye wash	2 boxes
2-in by 2-in bandage	8 (2 boxes)	Ice packs	2 each
4-in by 4-in bandage	2 (2 boxes)	Adhesive tape	1 roll or box

The idea here is to keep the large first-aid box properly supplied, clean, and organized for use in the event of a critical emergency. For your reference, a list is attached to the outside of the large first-aid box identifying the supplies it contains. Your cooperation is appreciated by all of your coworkers.

EMERGENCY MATERIAL SKIDS

These skids are located at 30 crosscut MN TW and at 10 or 11 of section on the high side.

1. One skid to store and haul material
2. One chain used to help in hauling
3. 1,000 board ft of brattice board
4. Two rolls of brattice cloth
5. Two bow saws
6. Three claw hammers
7. 25 lb of 8d nails
8. 25 lb of 10d nails
9. 25 lb of 16d nails
10. Two shovels
11. One bundle of wedges
12. Twelve capboards
13. Four timbers
14. Five 5-gal buckets of Celtite (10 - 15c)
15. Four bags of rock dust
16. One ax
17. Six pogo sticks
18. One pointed trowel
19. One rectangular finishing trowel
20. One rectangular patching trowel

FIRE AUDIT FORM**EMERGENCY MATERIALS CHECKLIST FOR FIRE TRAM**

DATE:

- () 112 Kennedy metal stopping panels with associated head sills and twist clamps
- () 24 Kennedy stopping rib angles
- () 3 rolls of tape
- () 3 twist tools
- () 3 stopping jacks
- () 3 picks
- () 3 shovels
- () 9 buckets of Celtite 10 - 12 Airtite (or equivalent material for stopping construction)
- () 5 tons of rock dust

SURFACE FIRE BRIGADE TRAILER CONTENTS

A utility trailer with a trailer hitch will be located east of the administration building. The trailer will contain the following supplies and will be connected to an electrical receptacle to provide power to a heater and emergency light. The trailer is to be disconnected from the power source before moving it to the fire location. All surface vehicles, except the heavy equipment service truck, will have two 5/16 ball hitches for transporting the trailer. In addition, the 930 and 945 endloaders will be equipped to transport the trailer during inclement weather.

BREATHING APPARATUS

- Four Draeger PA-80-4,500 1-hr breathing apparatus
- Five spare compressed air cylinders

BUNKER GEAR

- 12 complete sets including fire repel firefighter coat and turnout bib pants, protective hood, firefighter's fire dome helmet
- 12 red carrying bags for bunker gear

FIREFIGHTING EQUIPMENT

- 300 ft of 2.5-in NST fire hose
- 400 ft of 1.75-in IPT fire hose
- Two 25-ft rolls of 4-in supply line fire hose
- Three H-VPGI nozzles, 1.5-in IPT
- One H-VPGI nozzle, 2.5-in NST
- One flowmeter, 1.5-in IPT
- One Elkhart 241-95 in-line foam eductor
- Two 5-gal pails of multipurpose foam; additional foam is located in the warehouse
- Two-gated wye, 2.5 in to 1.5 in
- Seven fire extinguishers
 - Four 20-lb fire extinguishers
 - One 30-lb fire extinguisher
 - One CO₂ fire extinguisher
 - One 150-lb wheel unit
- Four combination hydrant/spanner wrenches
- Six spanner wrenches
- One fire ax
- Two pike poles

- One hose clamp
- Four firefighting brooms
- Three water vests

ONE 6,000-WATT WINCO GENERATOR

- Four 500-watt mounted quartz lights (outside trailer)

ONE HAZMAT BOOK

FIRST-AID SUPPLIES

- One trauma kit
- First-aid kit
- One ked extrication device
- Four blankets

TOOLS

- Two boxes of tools
- One 12-in crescent wrench for natural gas shutoff
- Three electric extension cords
- Regular wood saw
- Regular broom for cleaning trailer

UNDERGROUND FIRE BRIGADE SKID CONTENTS

Firefighting Supplies

Firefighting Supply Box

1. 1 each - Three-way manifold (5-in Storz to 2.5-in NST)
2. 3 each - Adapter (2.5-in NST to 1.5-in NPSH)
3. 1 each - Adapter (5-in Storz to 4-in Victaulic fitting)
4. 1 each - Vari-X foam generator
5. 1 each - On/off valved pistol grip
6. 6 each - 5-gal VEE foam buckets
7. 4 each - Storz spanner wrenches
8. 2 each - Task Force tip nozzles (one with pistol grip)
9. 2 each - 1.5-in spanner wrench
10. Tools to open a stopping between the belt entry and the adjacent intake entry (**30 CFR 75.1103-9(a)(2)** requirement):
 - 1 each - Dutch head
 - 1 each - Ax
 - 1 each - Track Shovel
 - 1 each - Omega Block Saw
 - 1 each - 500-ft roll of 0.25-in rope
 - 1 each - tool bag with:

4-in screwdriver	Claw hammer
6-in screwdriver	Brass hammer
8-in crescent wrench	First-aid kit
10-in crescent wrench	S hooks
12-in crescent wrench	16 penny nails
15-in crescent wrench	Rolls of tape
Hacksaw	Bucket lid opener
 - 2 each - 14-in pipe wrenches

Fire Hose Box

(30 CFR 75.1103-9(a)(1) requirement):

1. 4 each - 100-ft lengths hi-volume 5-in Storz fire hose
2. 2 each - 25-ft lengths hi-volume 5-in Storz fire hose
3. 1 each - 50-ft length hi-volume 5-in Storz fire hose
4. 12 each - 50-ft lengths 1.75-in NPSH fire hose

Open Storage

1. 240 lb of rock dust (**30 CFR 75.1103-9(a)(3)** requirement) in six buckets
2. Two rolls thick curtain

MATERIALS LIST FOR MINE RESCUE EMERGENCY

- G Mine rescue clothes and mine boots
- G Spare change of clothes
- G Hard hats
- G Mine belts with name tags
- G Cap lamps
- G Apparatus for each member and two spare apparatus
- G Extra canisters or BG4 training canisters with extra filters and DraegerSorb
- G RZ tester and tools
- G Spare part for apparatus
- G Antifog
- G Leak-Tec
- G Apparatus bench procedures manual
- G Turnout gear
- G Nomex gloves and hood
- G Firefighter helmet
- G Extra O₂ bottles
- G Rescue rope and bands
- G Aprons with chalk
- G Thumping sticks
- G Hammers and nails
- G Spad guns
- G Spads and washers
- G Gas instrument
- G Chargers and extra batteries
- G Map boards with equipment
- G Two stretchers
- G Four fire extinguishers
- G Two blankets
- G One Exotecter
- G Two magnehelic gauges with tubing and pipe
- G Two sets of communication headphones
- G One 1,000-ft length of sound-powered cable with reel
- G One emergency procedures manual
- G EMT materials from competition list and two burn kits
- G One basket stretcher
- G Two mine rescue radios with batteries and chargers
- G Gas sampling bags, syringes, etc.
- G Rescue ropes and harness
- G Four fire lances

SAFETY TRAILER LOCATIONS

1. Position of safety trailers

All safety trailers are located in the kitchen or x-cut across the kitchen. In the longwall, it is located in front of the transformer. The only exception may be when a section is being developed, and the safety trailer will be located in the Main travelway.

2. Contents of safety trailer

- a. Five 100-ft fire hoses stored in a rack; some trailers have 55-gal barrels with 10- to 50-ft hoses
- b. One 5121 Akron nozzle placed on end of last fire hose
- c. One wheeled Ansul model 150 containing 125 lb of Foray multipurpose dry-chemical agent, one nitrogen bottle, and a hose with a nozzle
- d. One hitch used to haul trailer
- e. Four sets of bunker gear
- f. One scoop stretcher
- g. One portable potty
- h. One first-aid box with oxygen
- i. Twelve SCSRs in metal box

FIRE PROTECTION AND FIREFIGHTING STANDARDS

1. Foam generators

- a. Each mining complex shall have a trailer-mounted high-expansion foam generator stored on or near the surface.
- b. Each foam generator shall be equipped with 500 ft of #2 G-GC cable and is to have on hand another 1,500 ft of the same cable to reach remote power sources.
- c. Items to be stocked with the generator are:
 - 500 ft of 2.5-in fire hose with 2.5-in NH thread
 - 500 ft of 2-in fire hose with 2-in NPT threads and two nozzles with adaptors
 - A manifold with four 2-in NPT outlets for fire hoses or for the foam generator, with a 4-in by 2-in reducer (Victaulic)
 - Eight 4-in by 4-in by 10-ft posts
 - 1-in by 4-in lumber (or equivalent) (250 board ft)
 - Hammer and nails (8d, 16d, and roofing nails)
 - One roll of brattice
 - Spad gun, spads, and washers
 - Twenty 5-gal cans of foam concentrate

2. Firefighting storage stations

- a. Per 30 CFR 75.1100-2(i), emergency materials that shall be stored, not exceeding 2 miles from the working section, are:
 - 1,000 board ft of brattice boards
 - Two rolls of brattice cloth
 - Two handsaws
 - 25 lb of 8d nails
 - 25 lb of 10d nails
 - 25 lb of 16d nails
 - Three claw hammers
 - 25 bags of wood fiber plaster or 10 bags of cement (or equivalent material for stoppings)
 - 5 tons of rock dust

The following items shall be stored at central warehouse, boxed and ready:

- 500 board ft of 1-in lumber
- Three spad guns
- One can of spads
- One box spad washers
- One box 16d nails
- One box 8d nails
- Six carpenter hammers
- Six rolls brattice
- Six boxes rigipak foam
- Three axes
- Three handsaws
- Twenty-four 4-in by 4-in adjustable posts with bolts and nuts
- Five 100-ft lengths of 2-in fire hose with 2-in NPT threads
- Two fire nozzles
- Ten roof jacks, ratchet-type aluminum
- Four shovels
- 300 framing boards, 1 in by 4 in by 10 ft (or equivalent) (1,000 board ft)
- One bundle each cap pieces and wedges
- Four 30-lb fire extinguishers
- Two 10-lb sledge hammers
- Two trimming bars
- One pick
- Four 2-in fire hydrants
- One 24-hr supply of high-expansion foam

b. The following items shall be stored at each mine on the surface, boxed and ready:

- Five 100-ft lengths of 2-in fire hose with 2-in NPT threads
- Two fire nozzles
- One spad gun
- One box spad washers
- Two claw hammers
- One box 8d nails
- One box 16d nails
- One ax
- Two rolls brattice
- Two 30-lb fire extinguishers
- Two 1.5-in pipe nipples
- Two 2-in pipe nipples
- Two 2-in to 1.5-in bell reducers
- Two large water pump pliers

- One 2-in fire hydrant valve
- Two 12-in pipe wrenches
- One scaling bar
- Two pocket knives
- One pick
- Four 2-in fire hydrants
- One manifold with four 2-in outlets

Emergency material to be kept on each miner section:

- Two portable fire extinguishers (20 lb minimum)
- 240 lb of rock dust
- Water lines extended to section loading point (tailpiece) with enough hose (500 ft minimum) to reach each face

FIRE PREVENTION EQUIPMENT CHECKLIST

Fire Prevention Equipment Checklist

Emergency sled	<input type="checkbox"/> 700 ft of fire hose with nozzle <input type="checkbox"/> Vari-X foam generator and eductor <input type="checkbox"/> Three buckets of foam concentrate <input type="checkbox"/> Two rolls of brattice cloth <input type="checkbox"/> Two boxes of nails (6p and 8p) <input type="checkbox"/> 12 or more SCSRs <input type="checkbox"/> Emergency escape map
Oil station	<input type="checkbox"/> Five bags of rock dust <input type="checkbox"/> One 10-lb fire extinguisher <input type="checkbox"/> Area well dusted and free of trash
Power center	<input type="checkbox"/> Five bags of rock dust <input type="checkbox"/> One 100-lb fire extinguisher <input type="checkbox"/> Area well dusted and free of trash
Water pump	<input type="checkbox"/> Five bags of rock dust <input type="checkbox"/> One 10-lb fire extinguisher <input type="checkbox"/> Area well dusted and free of trash
Feeder	<input type="checkbox"/> Controls and pump area clean, free of oil and oil-soaked coal dust <input type="checkbox"/> Fire suppression system intact <input type="checkbox"/> Machine and tailpiece free of excessive accumulations of coal dust and/or spillage
Dinner hole/ repair wagon	<input type="checkbox"/> Area well dusted and free of trash <input type="checkbox"/> One fire extinguisher <input type="checkbox"/> Compressed gas cylinders stored correctly and secured <input type="checkbox"/> Remote fire suppression operative
Continuous miner	<input type="checkbox"/> Remote fire suppression operative <input type="checkbox"/> Manual fire suppression operative <input type="checkbox"/> Hose for a hose fire suppression operative (if available) <input type="checkbox"/> Miner clean, no oil or oil-soaked coal accumulations <input type="checkbox"/> Fire nozzle and adapter stored on miner <input type="checkbox"/> Operator has methane spotter and is making proper checks

- Roof bolter Fire suppression system intact
 Bolter clean and free of oil or oil-soaked coal
 Operator has methane spotter and is making proper checks

Coal haulers

- Unit #
 Fire suppression system intact
 Hauler clean, free of oil and oil-soaked coal
 SCSR OK

- Scoop Fire suppression system intact
 Scoop clean, free of oil and oil-soaked coal
 Operator has methane spotter and is making proper checks
 SCSR OK

- Belt Two 20-lb fire extinguishers at drive area
 Five bags of rock dust at the starter box
 Five bags of rock dust at the take-up
 One 10-lb fire extinguisher at the take-up
 Drive clean and free of coal and oil accumulations
 Fire sensor system tested and operative
 Fire deluge system intact
 Fire sensors every 125 ft along beltline
 Fire outlets located every 300 ft or less along beltline

FUNCTIONAL TEST OF MINE MONITORING SYSTEMS

Req. By:
Run on: at:

Page:
Report:

Stand Alone PM

Version:

JOB CARD FOR TASK NUMBER E001
7-DAY INSPECTION MSHA REQUIREMENT

WORK GROUP:
EQUIPMENT NUMBER:

RESOURCE TYPE NO. REQUIRED EST. HOURS

“ _____ DATES _____

LAST SCHEDULE DATE LAST PERFORMED DATE NEXT SCHEDULE DATE JOB PRIORITY MAINTENANCE TYPE

COMPONENT MODIFIER SEQUENCE

-- COMPLETION TEXT --

-- JOB INSTRUCTIONS --

ELECTRICAL
NECESSARY MATERIALS: CO CALIBRATION KIT
07 DAY INSPECTION
DATE DUE:

NEXT DUE DATE:

CALIBRATED BY: _____ DATE: _____

1. INFORM SECURITY, WORKING SECTIONS, BELT PEOPLE,
AND SHIFT FOREMAN THAT YOU WILL BE CREATING A
MINE-WIDE ALARM FOR TESTING PURPOSES ONLY _____

A. INFORM THEM OF AN APPROXIMATE TIME THAT
YOU WILL PERFORM THE TEST.

2. PICK A BELT CO ANYWHERE UNDERGROUND, BUT DO NOT
IDENTIFY TO SECURITY WHAT THAT CO IS. _____

3. APPLY CO GAS TO START MINE-WIDE ALARM _____

4. CALL SECURITY AND ASK IF THEY RECEIVED A
MINE-WIDE ALARM AND FROM WHERE THE ALARM
ORIGINATED. IF SECURITY ANSWERS CORRECTLY _____
THE TEST WAS A SUCCESS. _____

5. ** IMPORTANT ** HAVE SECURITY ENTER IT IN
THE CONSPEC WEEKLY FUNCTIONAL TEST BOOK. _____
BOOK IS ON THE SHELF JUST ABOVE THE CONSPEC

PRINTER. MAKE SURE THEY SIGN IT, ALSO. _____

=====

ADDITIONAL COMMENTS: _____

REVIEWED BY: _____ DATE _____

MINE MONITOR INSPECTION REPORT

	DATE	INSPECTED BY:
CHECK POINTS	STATUS	COMMENTS:
ISOLATOR BOX BLINKING	YES - NO	
ACC STATS/TRUNK 1 AND 2	YES - NO	
PAPER IN PRINTER	YES - NO	
SEQUENCE MONITOR FLASHING	YES - NO	
TIME AND DATE ON LISTING	YES - NO	

POWER UNIT

AC - READY - CHARGER LIGHTS ON	YES - NO	
INVERTER AND ALARM LIGHTS OFF	YES - NO	
VOICE ALARM WORKING	YES - NO	
DISPLAY AND OPERATING CHECKS	YES - NO	
CO'S CHANGING TRUNK 1 - NINE RIGHT	YES - NO	
CO'S CHANGING TRUNK 2 - THIRD SW	YES - NO	
CLEAR BUFFER SCREEN	YES	

INVESTIGATE ALL NO'S!

NOTES

NAME: _____ DATE: _____

CONSPEC EMERGENCY COMMUNICATION CENTER ACTIVITY LOG

COMMENTS:	
TIME:	
READINGS:	
LOCATIONS:	
TIME:	
READINGS:	
LOCATIONS:	
TIME:	
READINGS:	
LOCATIONS:	
TIME:	
READINGS:	
LOCATIONS:	
TIME:	
READINGS:	
LOCATIONS:	

CUTTING/WELDING PERMIT (EXAMPLE 1)

CUTTING/WELDING OPERATIONS

Hot work permit

1. Call communication coordinator
2. Methane check: every 20 min
3. Rock dust before starting
4. 10-lb fire extinguisher or 240 lb rock dust
5. Blankets to cover area, surface only
6. Protective equipment
7. Long sleeves or weldingleathers
8. Welding gloves
9. Safety glasses
10. Welding hood: check for holes, cracks in lens
11. Cutting goggles: check for broken lenses
12. Leg bands or cuffs tied

CLOSE-OUT INSPECTION - 1 HOUR

1. Inspection date: _____.
2. Inspected by: _____.
3. Conditions found: _____

 _____.
4. Call communications coordinator to inform of followup inspection
5. Turn in tag to shift manager or preparation plant supervisor (surface).

ADDITIONAL SAFETY CHECKS

1. Examine work area for:
 - a. Stumbling hazards
 - b. Unsafe roof conditions
 - c. Adequate ventilation coursed to return
 - d. Cleanliness: grease, oil, coal dust removed
2. Ground clamp secured
3. Inspect equipment before using: torch, welder, etc.
4. Warn others before striking an arc
5. When welding overhead-protect ears with nonflammable material
6. *Do not gob hot material*

CUTTING/WELDING PERMIT (EXAMPLE 2)

HOT WORK PERMIT

Note: Before issuing this permit, all of the precautions described in company SOP should be followed.

Both columns must be completed

Good for this shift ONLY _____
date

From _____ to _____
time time

Bldg. _____ Dept. _____ Floor _____

Work to be done: _____

Work performed by: _____

FIRE watch assigned? Yes No

Names of fire watches: _____

Other special precautions taken: _____

I have been instructed, and I understand the hazards, as well as the precautions necessary to do this work.

Signature of person performing work

I verify that the work site has been inspected, all necessary precautions have been taken to prevent fire, and the individual who has signed above is authorized to do this work.

Signature of supervisor

Date and time of signature

1. Have all flammable or combustible materials been removed from the work area (35-ft radius)? Yes No
2. If any flammables or combustibles cannot be removed, have they been properly covered by fire-resistive shields or tarpaulins? Yes No
3. Are fire extinguishing systems in service? Yes No
4. Are adequate portable fire extinguishers and/or hoses provided? Yes No
5. Have combustible floors or roofs been wet down and/or properly covered? Yes No
6. Have wall or floor openings been properly covered? Yes No
7. Is hot work equipment in good working condition? Yes No
8. Is a confined space permit required? Yes No
9. Is a line breaking permit required? Yes No
10. Is lockout/tagout required? Yes No
11. Has the atmosphere been checked with a combustible gas detector? Yes No
12. Is ventilation adequate? Yes No
13. Is adequate PPE provided (glasses, mask, gloves, breathing apparatus)? Yes No

Work completed _____
Date/time

I have inspected the worksite after completion of the work and find the area to be in safe condition.

Signature of supervisor

Date and time of signature

SPECIFICATIONS FOR SLOPE WATER LINE

PERFORMANCE

The slope water line system shall deliver 50 gpm to each of three hydrants. The pipeline shall be drained after each use and normally kept empty to prevent freezing. Water shall be introduced via an electrically operated valve that can be locally (coal seam at surge bin) or remotely (Communications-Warehouse) actuated. The drain valve shall be interlocked with the supply valve and must be closed prior to opening the supply valve. There will be local and remote indication of valve positions. The supply and drain valve shall have manual override of electrical actuator.

MATERIAL SPECIFICATIONS

Pipeline

Three-inch nominal diameter aluminum pipe schedule 40 furnished in 20-ft lengths with grooved Victaulic style 77 couplers.

Supports

Pipeline shall be supported at least every 10 ft. An additional support shall be provided at each tee. The support shall consist of a fiberglass Enduro Model #SR1-9P furnished by Westfall Co. The support shall be secured to the concrete wall with two 3/8-in-diam "red-head" studs, stainless steel type.

Use a pipe clamp on each support. Clamp to be Model #PC-1617N.

Supply and Drain Valve

The supply valve shall be 3-in Trivaco MAK150 SG07-M. Adams Class 300 rotary tight shutoff valve. Rated for 210 psi. CS double flanged body, 316 SS Disc and seat. NI Resist pressed bearings, and zero leakage. It shall be actuated by 115 v AUMA SG07 Quarter-turn actuator complete with water-tight enclosure.

The drain valve shall be a nominal 1-in 110 v, SS construction, normally open. Similar to McMaster Carr 4665K46, page 1428, catalog 100.

Air Release Valve and Vacuum Breaker

The air release valve shall be C.I. 1-in by 0.5-in similar to McMaster Carr 48045K73, page 1438, catalog 100, 50 XI S.

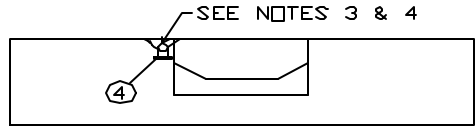
The vacuum breaker shall be 1.5 in by 1.25 in similar to McMaster Carr 4817K28, page 1429, catalog 100.

Water Tee

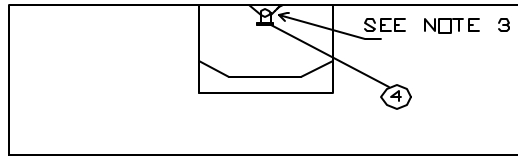
The tee shall be Victaulic style 72 — 3 in by 1.5 in.

The angle valve shall be rough brass 1.5 in UL 175# fire line angle valve.

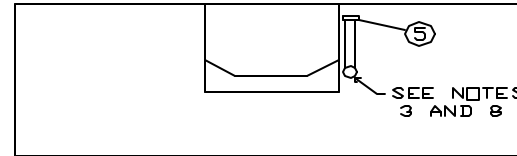
SPRINKLER SYSTEM FOR FREEZING AND NONFREEZING LOCATIONS



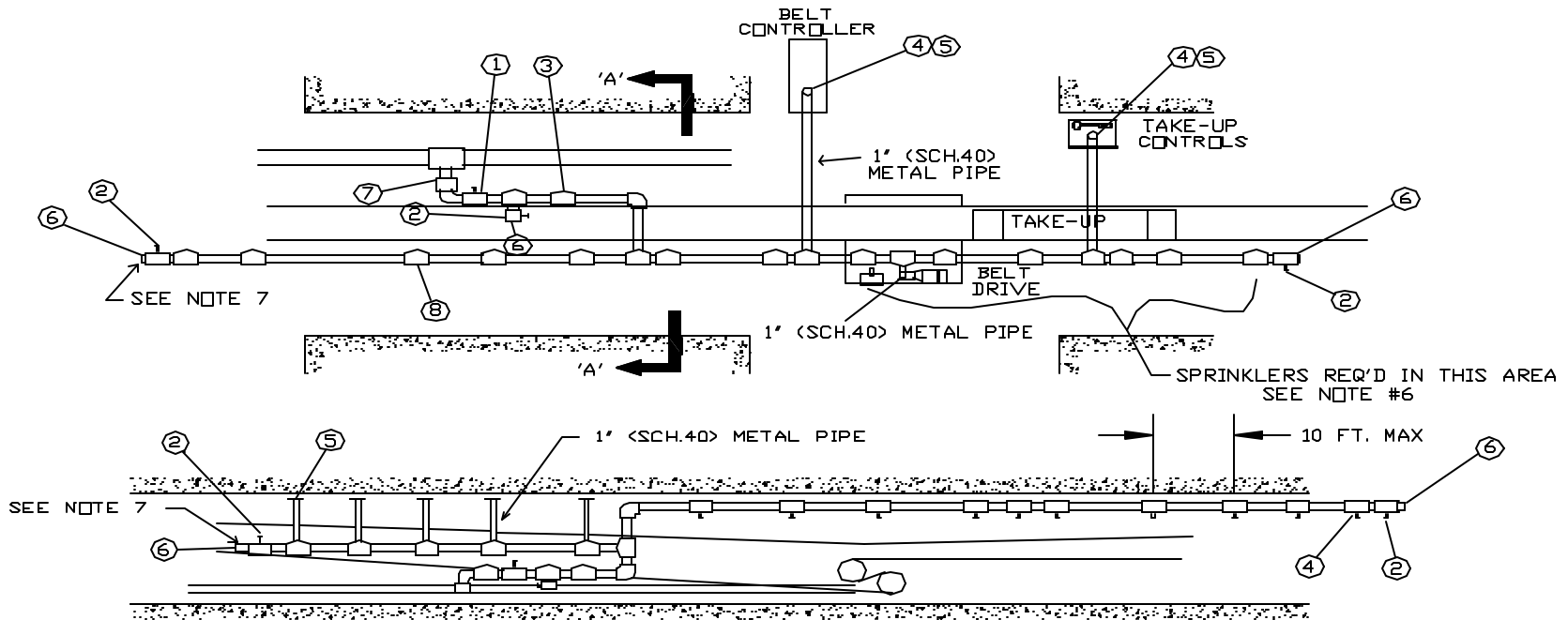
SECTION 'A' - 'A'
RESTRICTED AND ADEQUATE HEIGHT
PENDANT SPRINKLER



SECTION 'A' - 'A'
OPTIONAL
ADEQUATE HEIGHT
PENDANT SPRINKLER



SECTION 'A' - 'A'
OPTIONAL
RESTRICTED AND ADEQUATE HEIGHT
UPRIGHT SPRINKLER



GENERAL NOTES

1. All water pipes - 2 in (schedule 40) metal pipe, except as noted.
2. All pipe fittings - malleable iron - 300 lb. Extra heavy or equal.
3. Attach pipe to permit expansion movement.
4. If sprinkler is too low to have water discharge over belt, rotate pipe enough to get coverage. Flow test to adjust for proper tilt.
5. For freezing areas, system requires a 50/50 mixture of antifreeze (ethylene-glycol). To determine gallons required for 2-in pipe, multiply total number of feet (pipe in system) by 0.18, then divide by 2; this equals gallons of antifreeze.
6. 50-ft minimum at belt drive with fire-retardant belt. 150 ft minimum at belt drive without fire-retardant belt.
7. Optional 2-in outlet provided for optional 2-in hose connection to extend to remote head roller sprinklers.
8. Pipe may be mounted at any height. Uprights shall be installed to maintain sprinklers near the roof.

ELECTRICAL NOTES

- A. Contacts of item No. 3 to be wired in stop circuit of belt drive motor starter.
- B. Contacts of item No. 3 to be wired to fire detection system or audible visual alarm system.

KEY

1. 2-in ball valve class 300 FM approved or UL listed; pressure rating as required.
2. Ball valve class 300 FM approved or UL listed; pressure rating as required.
3. Waterflow switch FM approved or UL listed; pressure rating as required.
4. Sprinkler - pendant type - FM approved or UL listed; 0.5-in orifice, 212E F temperature rating.
5. Sprinkler - Upright type - FM approved or UL listed; 0.5-in orifice, 212E F temperature rating.
6. Pipe plug (optional 2-in outlet for headroller protection).
7. Valve - swing check - 2-in class 300 or equal (freezing areas only).
8. Reducing tee - 2 in by 2 in by 0.5 in - malleable iron - extra heavy or equal.

SUPPRESSION SYSTEM

MAINTENANCE - SEMIANNUAL EXAMINATION

To provide maximum assurance that your Ansul A-101 system will operate effectively and safely:

1. Note the general appearance of the dry-chemical tank for mechanical damage or corrosion.
2. Check nameplate for readability, corrosion, or looseness.
3. Remove fill cap.
4. Examine fill cap gaskets for elasticity. Clean and coat lightly with a good grade of high-resistant grease.
5. Inspect threads on fill cap and in fill opening for nicks, burrs, cross-threading, rough or feathered edges.
6. Check pressure relief vent in fill opening threads for obstruction.
7. Make certain tank is filled with free-flowing Ansul Foray dry chemical to a level of not more than 3 inches from bottom of fill opening.
8. Secure fill cap, hand tighten.
9. Disengage bursting disc union.
10. Examine the bursting disc. If necessary, move the tank slightly to view disc. The bursting disc should be properly seated with the washer side facing out (smooth side in) and should be undamaged (smooth, not scored or ruptured).
11. Engage bursting disc union (wrench tighten). *CAUTION:* Overtightening can damage bursting disc.
12. Loosen the bolt(s) that restrain the cartridge or remove extinguisher cartridge guard assembly.
13. Inspect the expellant gas cartridge assembly for evidence of mechanical damage or corrosion.
14. Unscrew the cartridge from the pneumatic actuator/cartridge receiver and weigh it. Replace if its weight is not within specifications stamped on the cartridge.
15. Inspect threads on cartridge and in pneumatic actuator/cartridge receiver for nicks, burrs, cross-threading rough or feathered.
16. Check pressure vent in pneumatic actuator/cartridge receiver for obstruction.
17. Examine cartridge receiver gasket for elasticity. Clean and coat lightly with a good grade of high heat-resistant grease. Return cartridge pneumatic actuator/cartridge receiver, hand tighten.
18. Tighten the bracket bolt(s) uniformly or return cartridge guard assembly.
19. Be sure the dry-chemical tank is firmly mounted in its bracket.
20. Check hose, fittings, and nozzles for mechanical damage.
21. Check nozzle openings. Slot should be closed (capped) with silicone grease or covered with plastic blowoff cap.
22. Check remote actuator. Remove cartridge and weigh (replace if weight is 0.25 oz less than stamped on cartridge). Inspect threads on cartridge and in actuator for nicks, burrs, cross-threading, rough or feathered edges. Check pressure safety vent in actuator body for obstruction. Examine actuator cartridge gasket for elasticity. Clean and coat lightly with a good grade of high heat-resistant grease. Pull ring pin and operate actuator button several times to check for free movement.
23. Seal ring pin to puncture lever with lead and wire seal. Return cartridge to remote actuator, hand tighten.
24. Record date of maintenance.

ANNUAL FUNCTIONAL TEST OF THE FIRE SUPPRESSION AT BELT DRIVES

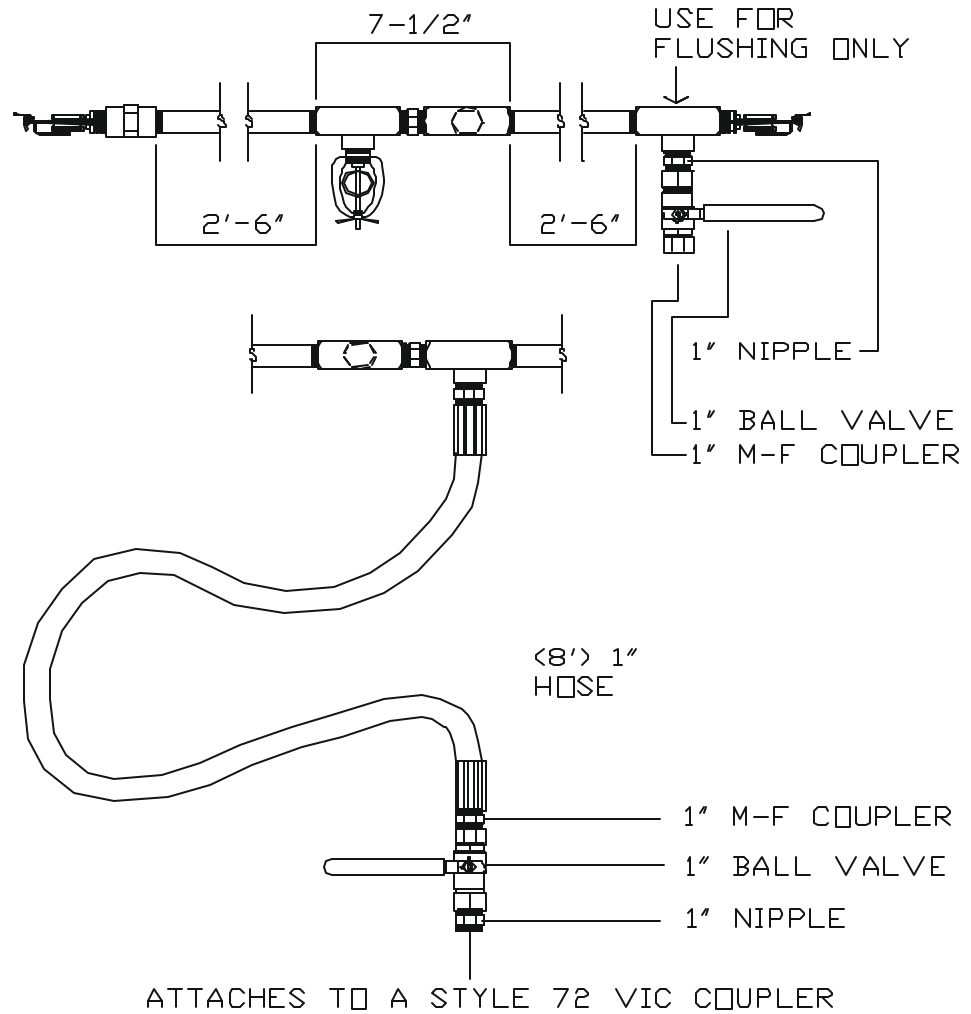
30 CFR 75.1107-16(b)

This test is done to make sure that:

1. Water flows through each branch line in the system.
 - a. The last spray in each branch line of the fire suppression system has a tee with the spray pointed toward the belt. The other side of the tee has a ball valve. This ball valve allows testing to be done without using tools.
 - b. The ball valve may be at the end of the branch line and not hooked to a spray or tee. The same results will take place when testing.
2. When the ball valve is opened and water is flowing, the belt should shut off and the alarm will automatically be activated on the computer in the guard shack.
3. If any of these results are not obtained, correction shall be made at once, and the Safety Department is notified of shortcoming.

DRAWING OF A TYPICAL WATER LANCE

TYPICAL LANCES



INDIVIDUAL WORK HAZARD ASSESSMENT

Name	Date	Shift	Crew
Return at end of shift			
Protective Equipment Checklist			
Metatarsal safety shoes/hard hat?		Mandatory	
Safety glasses?		Mandatory	
Hearing protection needed?		Yes	No
Gloves or respirator needed?		Yes	No
Cutting goggles/welding hood needed?		Yes	No
Fall protection required?		Yes	No
Ice grips or life vest needed?		Yes	No
Preoperational Equipment Inspection			
Equipment type:		Equipment #:	
Substandard conditions observed, but not corrected (describe):			
Was a work order generated to correct these conditions?		Yes	No
Work Area Inspection			
Substandard conditions observed, but not corrected (describe):			
Were these conditions reported to a supervisor?		Yes	No
Job Safety Analysis (JSA)			
Work task(s) performed:			

Does a JSA exist for task(s) performed?		Yes No
Was the JSA reviewed?		Yes No
Was an "individual" JSA developed for task? Yes No (see details on next page)		
Fls:	Smm:	Supt:
Time reviewed:	Time reviewed:	Time reviewed:

Daily Work Assignments

“Individual” Job Safety Analysis		
Job:		Location:
Sequence of Basic Job Steps	Potential Accidents or Hazards	Recommended Safe Job Procedure

BELTLINE INSPECTION CHECKLIST

Date: _____ Shift _____

Belt No. _____

<u>OK</u>	<u>Defective</u>	<u>Date</u> <u>Repaired</u>	
_____	_____	_____	Stoppings
_____	_____	_____	Doors
_____	_____	_____	Guards
_____	_____	_____	Cross-overs/unders
_____	_____	_____	Dust
_____	_____	_____	Roof/rib Conditions
_____	_____	_____	Belt idlers
_____	_____	_____	Drive/Take-ups
_____	_____	_____	Splices/wipes accumulations
_____	_____	_____	Trash/coal accumulations
_____	_____	_____	Wire/electrical
_____	_____	_____	Fire sensors
_____	_____	_____	Fire line
_____	_____	_____	Risers/valves
_____	_____	_____	Fire hose/nozzles
_____	_____	_____	Water sprays
_____	_____	_____	Fire suppression
_____	_____	_____	Extinguisher
_____	_____	_____	Ventilation
_____	_____	_____	Phones
_____	_____	_____	Welds/tie-downs
_____	_____	_____	Walkways
_____	_____	_____	Belt bank or take-up pressure
_____	_____	_____	Belt training

Comments: _____

Examiners: _____

Corrected by: _____

Routing list:

Belt Crew

Down Shift Supervisor

File

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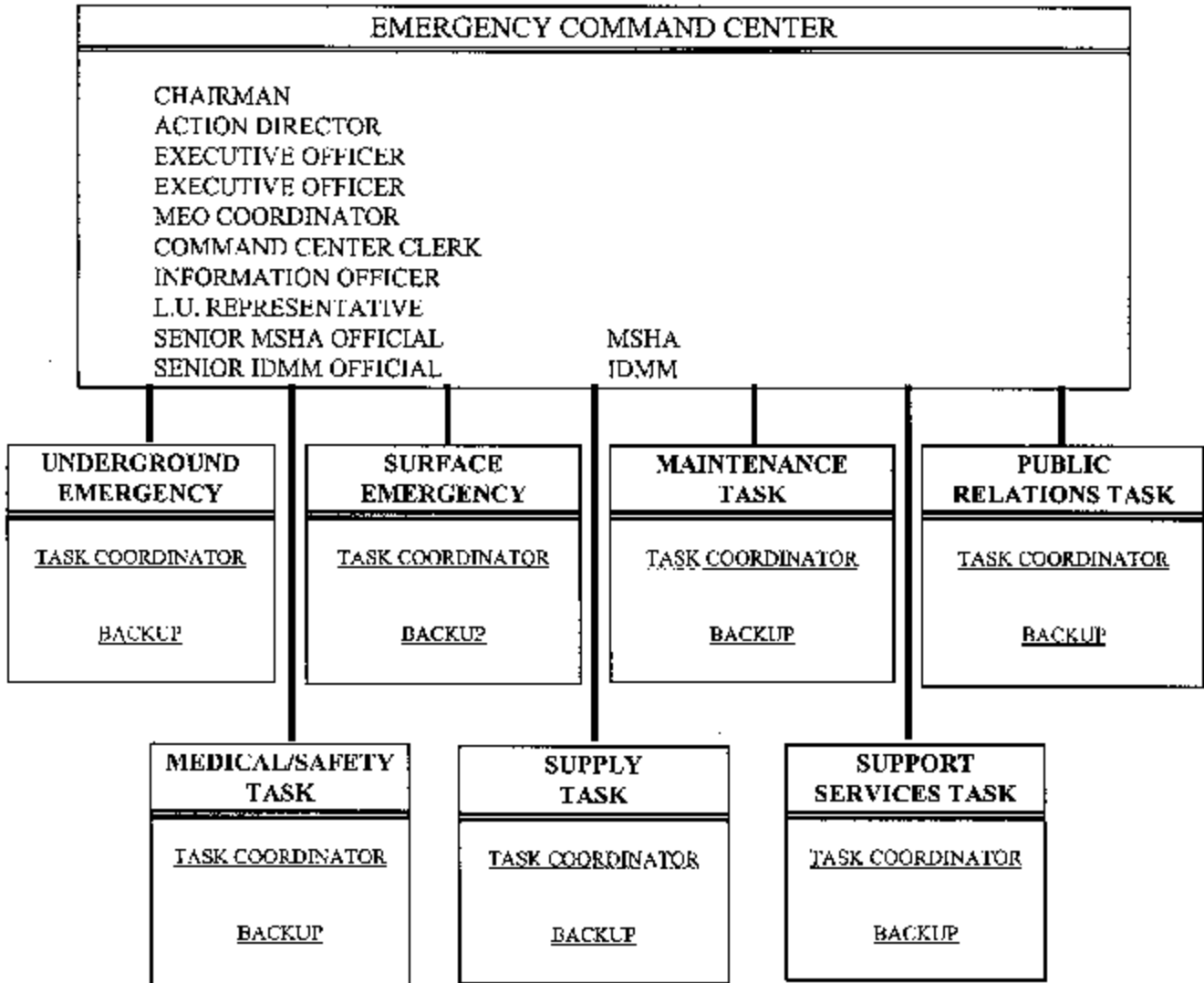
APPENDIX C.—EXAMPLES OF RESPONSE PLANS AND TRAINING PROGRAMS

MINE EMERGENCY OPERATION PLAN

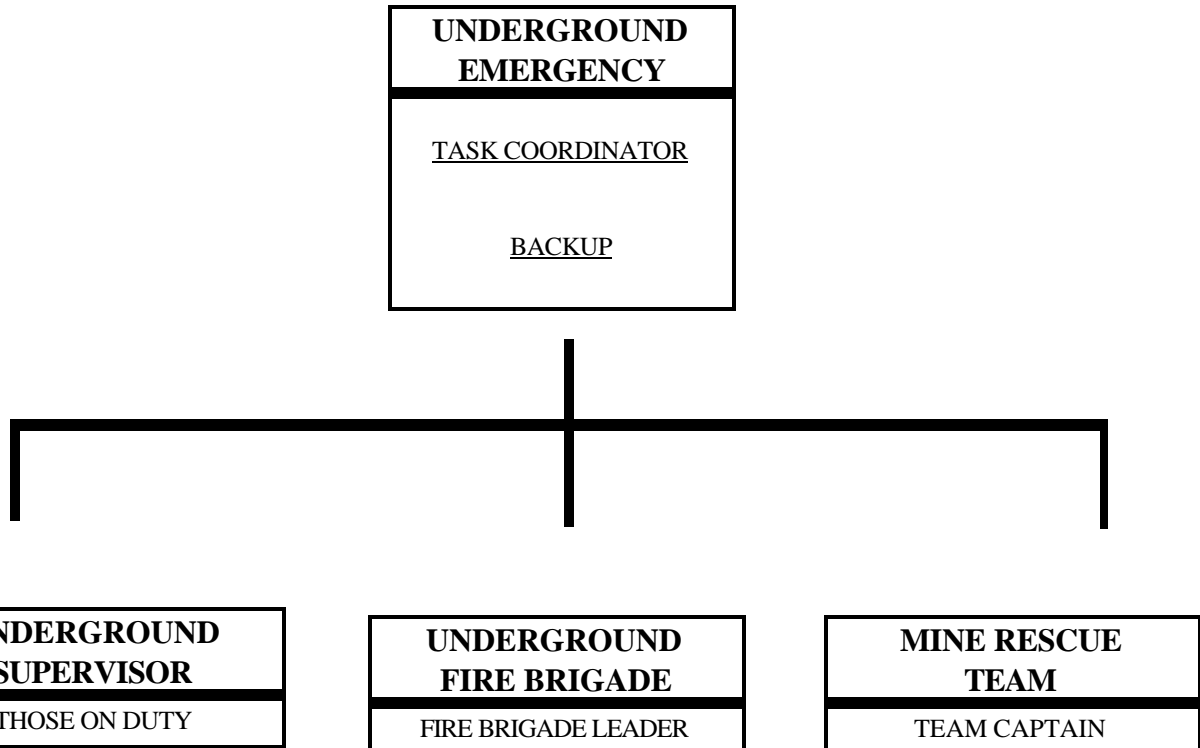
MEO Plan

COMMAND CENTER

COMMAND STRUCTURE



COMMAND STRUCTURE



P
E
R

PERSONNEL ASSIGNMENTS AND RESPONSIBILITIES

FIRST RESPONDER

- C Notifies Communications/Tech-Staff Warehouse of potential problem and to be on alert.
- C Post a person, if available, just outby the area to act as a sentry to:
 - Keep persons from inadvertently entering a dangerous area.
 - Log activities (for example, people evaluating area, firefighting, etc.)
 - Assist in notifying Communications.
 - Be available to respond to helping first responder in case of a problem (for example, smoke inhalation)

- Investigates to confirm evidence of fire/smoke (visual) and makes judgment on severity of situation.
 - If it is a small fire that can be extinguished, attempt to extinguish fire using appropriate safety precautions and existing safety equipment.
 - If the fire is so large that efforts to control are not working, then return back to sentry and notify communications to begin orderly evacuation of persons in by fire area. Give Communications/Tech-Staff Warehouse directions as to which escape route is safest and fastest.
- C Notifies appropriate personnel to shut off conveyor belts and/or kill power in affected area, if needed.
- C First responder remains at the site to assist in evacuation and, with help of the sentry, maintains constant communication with Communications/Tech-Staff Warehouse on status of fire and evacuation of potential problems.

COMMUNICATIONS

- C Immediately notifies Fire Detection Team and alerts available Fire Brigade members if source of smoke is not apparent.

Fire Detection Team: Shift Mine Manager; Safety Personnel; Maintenance Foreman; and Safety Committeeman

- C If problem cannot be controlled by the first responder, the Communications/Tech-Staff Warehouse will dispatch the Fire Brigade to the area.
- C Communications/Tech-Staff Warehouse immediately dispatches Top Shop Repairman (or ?) to Water Treatment Building to deactivate excess flow valve switch (located in northeast corner of building to right of breaker box). Switch must be turned from "remote" to "local." Ensure valve is open to fullest extent by manually pulling bypass valve wheel out 3/8 inches and rotating counterclockwise as far as possible. The valve is located in lower level of the Water Treatment Building.
- C Top Shop Repairman should then be directed to Smith Lake Pump Station to ensure and maintain function of water pumps.

- C Immediately notifies all underground areas of the problem. If necessary, begins evacuation of all personnel in affected areas and receives information on possible evacuation routes.
- C Notifies Mine Superintendent, Construction Coordinator/Operations Support, and Longwall Coordinator if a severe problem is found.
- C Contacts all surface foremen to come to Communications Center.
- C Shift Mine Manager informs Communications/Tech-Staff Warehouse to assign lamp man and/or one surface foreman to count and check off evacuated personnel and double check the check-in/check-out tag system
- C Assigns one Warehouse Clerk to remain with the Communications/Tech-Staff Warehouse to help answer/make phone calls.

Warehouse Clerk - Primary
Surface Foreman - Backup
Designee out of Labor Pool

- C Establish initial security at surface-controlled access locations by utilizing available Surface Foremen, Underground Foremen, or any available employees. Secures Mine Examiners Books from the Examiners Room and Visitors Log Book from the old Training Room.
- C Sees that subsequent events and communications are noted with respective times in the Fire/Smoke log.
- C Calls ambulance to be on-site for possible injuries resulting from fire or evacuation of mine.

SMOKE AND FIRE LOG

Name of Person(s) Reporting	
Times	
C First discovered	
C First reported	
C All subsequent information	
Location of Discovery	
C Main, submain, and/or panel	
C Intake, neutral, and/or return	
C Entry number(s)	
C Crosscut number(s)	
Source of Smoke/Fire	
C Actual source, if known	
C Source inby/outby discovery location	
C Smoke/fire traveling inby or outby	
Extent of Smoke/Fire	
C Smoke/fire detected by smell only	
C Smoke/fire visible	
C Visibility in feet	
C Entry numbers affected	
Any Other Pertinent Facts	
C Extent of efforts to extinguish	
C No. of people working in the area	
C No. of people working inby area	
C Active projects in the area	
C Is equipment deenergized?	
C Problems that may affect ability to evacuate inby personnel	

FIRST-LINE SUPERVISOR (OR PERSON IN CHARGE)

- C Secure work area:
 - Designate employee to monitor phone.
 - Shut off unit power and water.
 - Assemble entire crew.
- If time permits:
 - Back out all equipment outby last open crosscut.
 - Hang all ventilation curtains.
- C Prepare for evacuation:
 - Communicate all known facts to crew, emphasizing a safe, calm evacuation.
 - Distribute SCSRs.
 - Obtain escapeway map.
 - Notify Communications/Tech-Staff Warehouse that work area is secure and report any status change.
- C Evacuation:
 - Determine evacuation route based on all available information from Communications/Tech-Staff Warehouse and first responder. *Keep your crew together.*
 - Notify Communications/Tech-Staff Warehouse of departure time, names, and route.
 - Proceed to surface via designated escape route (call out location, if route has telephones.)
 - First supervisor on mine bottom helps coordinate caging of employees to surface and records name of those leaving the mine.
 - Other supervisors assign transportation to send in additional equipment and people as requested.

RESPONSIBILITIES OF FIRST SUPERVISOR ON SURFACE

- C Check off persons exiting the mine and persons already on surface.
- C Ensures that persons who have exited mine have “checked out” on the board.
- C Assemble workers and maintain order in waiting area.
- C Ensures that persons entering mine are logged in.

OPERATIONS CHECK-IN/CHECK-OUT PROCEDURES

- C The Shift Mine Manager is responsible to see that Check-In/Check-Out Procedures are initiated during an emergency mine evacuation. He/she will designate two first-line supervisors to coordinate caging and check-in/check-out from the mine.
- C The standard “Check-In/Check-Out Log” form will be used to document all activities by recording the name, affiliation, social security number, tag number, and time for anyone entering or leaving the mine.
- C The Check-In/Check-Out Official will be notified of the mine emergency by the Shift Mine Manager. This official will report to the mine and confirm the following:
 - A first-line supervisor is stationed at each portal.
 - A positive Check-In/Check-Out System is in place at each portal to restrict access into the mine and to document the exit of personnel.
 - All information is being documented on the “Check-in/Check-Out Log” form by the first-line supervisor and sufficient forms are available.
- C The Check-In/Check-Out Official must also:
 - Obtain a list from Operations or Payroll of all personnel who were in the mine prior to the emergency.
 - Based on this information and Check-In/Check-Out Logs, determine which personnel are still in the mine.
 - Provide all appropriate information to the Shift Mine Manager.
 - If necessary, set up a rotation schedule for first-line supervisors monitoring check-in and check-out at portals.
 - Arrange for a guard from the labor pool to guard the slope entrance.

SHIFT MINE MANAGER/MAINTENANCE FOREMAN

- C Firefighting Brigade Mobilization:
 - Team members proceed to site of fire, taking fire brigade equipment from area storage.
 - Arrive at site, evaluate situation, and put on appropriate protective gear.
 - Devise plan of attack and outline any materials/equipment needed, and relay this information to Communications/Tech-Staff Warehouse. Also, request any extra people/equipment needed.
 - Kill all power at fire site and in by fire area, lock out the trolley power out by the fire area. Station someone at this point, and do not let other people in by this point unless they are associated with the fire brigade.
 - Decide within 15 min on the scene whether to call mine rescue team members and fire brigade members on other shifts for backup.

OTHER ACTIONS

SURFACE

- C Surface fire brigade members are notified to get the fire brigade equipment trailer and bring it to the elevator so that equipment bags can be sent underground.
- C Safety department personnel get all necessary carbon monoxide (CO) detectors, modified sampling pumps, and sample tubing from their office. Additional handheld radios from Communications Center are also acquired. This equipment is to be taken/sent underground to fire site:
 - Prepares first-aid area for any reported injuries.
 - Sees that procedures are followed for notifying regulatory agencies.

FIREFIGHTING GUIDELINES

- C Initial response to a significant mine fire event:
 - CO and methane gas levels must be monitored in the fire area, return, and intake to the fire area.
CO 10 ppm: indication of a fire
50 ppm: irrespirable atmosphere
 - Using modified sampling pumps or protective breathing apparatus to determine CO reading in the return. *Do not adjust ventilation to the fire site.* Take CO and methane readings every 15 min and set up sampling pumps, if prolonged effort is envisioned.
 - Notify the Communications/Tech-Staff Warehouse if extra air tanks are needed or if refilling of air tanks is needed, and set up delivery system.
 - Have warehouse send foam generators and additional foam, if needed.
- C If firefighting actions exceed 15 min:
 - Send top shop repairman to exhaust fan for monitoring. Send modified sampling pump, CO and methane detector to fan with one underground foreman. Monitor exhaust fan readings every 15 min and report readings to Communications/Tech-Staff Warehouse.
 - Send one underground foreman to gate and control access until the Mine Emergency Organization is operating.
 - Send one repairman and underground foreman with pager phone from warehouse to locked out power switches. Establish communications with Communications/Tech-Staff Warehouse.
 - Send one foreman to the Communications Center to specifically log all firefighting activities and respective times.

EMERGENCY RESPONSE (EXAMPLE 1)

A. FIREFIGHTING AND EVACUATION PROCEDURES INBY FIRE AREA

If a fire occurs or is suspected (i.e., alarm(s)) outby the working section, all personnel who are inby the fire area shall be immediately withdrawn to a point outby the fire area, at which time they will be assigned to firefighting activities or be withdrawn from the mine.

The supervisor inby the fire area should:

1. Be in charge of the evacuation of those persons under his/her charge.
2. Account for all persons within his/her respective area.
3. Designate the escape route to be taken and notify the responsible person on the surface that an evacuation is underway and the escape route to be used.
4. The supervisor or his/her designee will check at frequent intervals at manddoors to see if the fire area has been passed, if the fire area is unknown at the time of evacuation.
5. When the fire area is passed, leave the emergency equipment in an accessible location.
6. In the event that escape is impossible, the crew will travel to an area that can be safely barricaded. The following procedures should be followed:
 - (i) Note outside of the barricade the number of persons and what time the barricade was entered.
 - (ii) Inside the barricade conserve food and water.
 - (iii) Conserve battery lights by using only one at a time, and conserve air by remaining inactive.
 - (iv) Circulate the air occasionally by having one person walk back and forth with their coat extended.
 - (v) One person should pound on a pipe, belt structure, roof bolt, rail, or other sound conductor at 15-min intervals to alert rescue crew(s) as to the location of the barricade.

7. Supervise the evacuation and see that the following assignments are carried out:

PERSONNEL ASSIGNMENTS FOR WORKING SECTIONS INBY A FIRE

<i>Miner section</i>	<i>Longwall section</i>	<i>Personnel assignments</i>
Mechanic	Mechanic	Assist Supervisor(s)
Miner Operator	Shearer Operator	First-aid supplies
Miner Operator	Shearer Operator	Hammer and nails
Roof Bolter	Cornerman	Saw and ax(es)
Roof Bolter	Laborers	Spads and spad gun
Shuttle Car Operator	Propman	Brattice cloth
Shuttle Car Operator	Propman	Brattice cloth
Faceman	Faceman	Account for and distribute SCSRs and see that each person has his/her lunch bucket.

B. GENERAL FIREFIGHTING PROCEDURES

It is recognized that the majority of mine fires are not of major proportions and can be readily brought under control. However, the seriousness that could develop must be considered with a predetermined plan for firefighting and evacuation of underground mine personnel.

The following procedures should be followed in the event of a mine fire:

1. If a fire is found or suspected, immediate action shall be taken to find and correct the cause, and the requirements regarding notification shall be implemented immediately.
2. Firefighting activities shall be started as soon as possible and continued until the fire is extinguished or until it cannot be safely controlled.
3. All electric power shall be deenergized in areas affected when posing a hazard to individuals in that area.
4. Maintain control of and know the location of all persons in the fire area, and remove those not required for firefighting activities.

5. A carbon monoxide detection instrument shall be transported to the fire area and sampling started as soon as possible.
6. Always attack the fire from the smoke-free side, if possible.
7. Never use water on an electrical fire until the power is deenergized.

FIRE DRILLS

All miners shall participate in fire drills in accordance with 30 CFR 75.1101-23(c).

A. TYPE OF TRAINING

1. Various types of training may constitute a fire drill (for example, demonstrations, hands-on training, group discussions, and task-oriented training).

ESCAPEWAYS

The following shall apply with regard to escapeways:

A. ROUTES OF TRAVEL

1. Main escapeway systems and working section escapeways shall be reviewed with all miners in accordance with 30 CFR 75.383(a) and (b).

B. ESCAPEWAY MAPS

1. Posting of maps showing the main escapeway system and working section escapeways shall comply with 30 CFR 75.383(a).

C. LIFELINES

1. A lifeline will be made available in each working section at or near the SCSR storage cache for use by the section crew in the event of an emergency. The lifeline will have hookups at no more than every 7 ft. If tag lines are used, they should be no longer than 3 ft.

EMERGENCY RESPONSE (EXAMPLE 2)

GENERAL SURFACE FOREMAN

1. Shall go immediately to the mine monitor room, see that the on-site notification plan is in progress, and ensure that all crews and affected persons have been notified.
2. If the person in charge of the shift is not on the surface, the foreman shall assume temporary charge of the operation and begin immediate implementation of the mine emergency responsibilities plan.
3. Assign a guard(s) at the mine portals to check all persons in and out of the mine. (A written log shall be kept.)
4. Assign an attendant(s) at the fan to ensure that the fan is operational, and take gas readings for carbon monoxide and methane (a written log shall be kept). If the fan was stopped, it shall not be restarted without authorization from the official in charge.
5. Assign the bathhouse man to make a positive, written accounting of all persons on shift who check out of the mine.
6. Assign a competent person to log conversations on the mine phone, and assist the monitor operator with his/her duties.
7. Assign persons to ready emergency materials, including the foam generator and fire trailer for transport underground.
8. Secure all accessible entrances to the mine property to prevent entrance of unauthorized personnel.
9. Organize a crew to load and deliver all needed supplies to the mine.
10. Assemble and load on supply trucks all emergency materials. The following materials should be promptly assembled (these are in addition to the mine emergency package maintained at the mine):
 - a. 40 pieces of 2-in by 4-in lumber in lengths of 8 to 16 ft
 - b. 5,000 board ft of brattice board
 - c. 200 cap pieces and 200 wedges
 - d. 1,000 concrete blocks
 - e. 12 bags of mortar mix
 - f. 15 packages of rigipak

11. In addition to these supplies, other materials such as timber, crossbars, additional cap pieces and wedges, cement blocks, etc., should be located and prepared to be sent underground as needed.
12. Arrange for the scheduling of persons under his/her supervision to provide for uninterrupted coverage during the emergency.
13. Arrange for persons from other mines for possible backup duty.
14. Keep surface area clear of all unnecessary equipment or vehicles.

MINE WAREHOUSE SUPERVISOR OR WAREHOUSEMAN

1. Proceed immediately to the mine monitor room, assist with notification of underground personnel if needed.
2. Shall be responsible to make immediate off-site notification by phone of the following persons (if not on shift):
 - a. Mine Manager
 - b. Chief Mine Safety Engineer
 - c. Mine Superintendent
 - d. General Mine Foreman
 - e. Maintenance Superintendent
 - f. Senior Mine Engineer
 - g. Warehouse Supervisor
 - h. Mine Clerk

A written log of persons contacted shall be kept.

3. Prepare any emergency kits, such as fire boxes, which are stored in the warehouse, for immediate transport underground.
4. Make provisions for the immediate use of the following: nails, brattice, hammers, axes, saws, picks, scaling bars, shovels, spad guns and spads and washers, fire extinguishers, rock dust, fire hose, rigipaks, telephones, phone wire, and hangers. For persons authorized by mine management, also arrange for coveralls, boots, gloves, hard hats, belts, and other safety equipment.
5. Keep a record of all equipment issued and returned.
6. Have assembled materials to be sent to the fresh air base for rescue workers, such as drinking water, Gatorade, first-aid supplies, wet gear, etc.

7. Arrange for uninterrupted coverage in the warehouse.
8. Coordinate activities with Central Warehouse and Central Purchasing.
9. Order adequate supplies and equipment for use during the emergency.
10. Coordinate materials to be delivered with the surface foreman, Central Warehouse, and purchasing. Notify the person in charge when needed materials are sent underground.

EMERGENCY RESPONSE (FIRE DETECTION FOR TWO-ENTRY SYSTEM)

The development of two-entry longwall systems will be done under the stipulations pertaining to the Decision and Order for Petition for Modification, Docket No. 86-MSA-3, and outlined as follows:

I. Development of the Two-Entry System

- (a) An early-warning fire detection system utilizing low-level carbon monoxide detectors shall be installed in the panel intake escapeway entry and the panel belt entry used as a return air course as follows:
 - (1) At the mouth of the panel in the intake escapeway entry, at the beginning of the working section, and at intervals not to exceed 1,000 ft along the panel intake escapeway entry.
 - (2) At the mouth of the panel in the return/belt conveyor entry, not more than 50 ft outby the section belt tailpiece, at intervals not to exceed 1,000 ft along the panel return/belt conveyor entry, and at each belt drive, except as provided in paragraph III(1).
- (b) In addition to the carbon monoxide monitoring devices installed in the belt haulage entry, approved methane monitors shall be installed as follows:
 - (1) Approved methane monitoring devices shall be installed to monitor the return air in each belt haulage entry. Such devices shall be located so that the return air is monitored near the mouth of the longwall section, near the tailpiece of the belt conveyor, and at or near any secondary belt drive unit installed in the belt haulage entry.
 - (2) The methane monitoring devices shall be capable of providing both audible and visual alarm signals on both the working section and at a location on the surface where personnel will be on duty at all times when miners are underground and have two-way communication with all working sections. When the level of methane equals or exceeds 1.0 volume per centum, the device shall initiate alarm signals and shall deenergize the belt conveyor drive units and the equipment located on the section.
 - (3) The methane monitoring devices shall be visually examined at least once every 24 hr to ensure proper functioning. The unit shall be inspected by a person qualified for such work at intervals not exceeding 7 days. The qualified person shall ensure that the monitor is operating properly and that the required maintenance as recommended by the manufacturer is performed. The monitor shall be calibrated with known quantities of methane-air mixtures at intervals not exceeding 30 calendar days. An inspection record shall be maintained on the surface and made available to all interested persons. The inspection record shall show the date and time of each weekly inspection and calibration of the monitor and all maintenance performed.

II. Retreat Mining in the Two-Entry System

- (a) An early warning fire detection system meeting the following requirements shall be installed as follows:
 - (1) A low-level carbon monoxide detection system shall be installed in the belt entries utilized as intake air courses.
 - (2) The carbon monoxide monitoring devices in the intake entries shall be located so that the air is monitored at each belt drive and tailpiece and at intervals not to exceed 1,000 ft in each conveyor belt entry, except as provided in paragraphs II(a)(3) and III(1). The monitoring device located at the tailpiece shall be at the tailpiece or not more than 50 ft in by the tailpiece on the same split of air.
 - (3) Where a belt drive discharges onto a belt conveyor tailpiece in the intake entries as a continuation of a belt conveyor haulage system without a change of direction of the belt conveyor and the belt conveyor drive, belt take-up, and belt conveyor tailpiece are on the same split of air traveling in the same direction, only one low-level carbon monoxide sensor is required. It shall be installed not more than 100 ft in by the drive, belt take-up, and tailpiece on the same split of air.
- (b) A low-level carbon monoxide detection system shall be installed in the panel intake escapeway entry at the mouth of the panel in the intake escapeway entry, at the beginning of the working section, and at intervals not to exceed 1,000 ft in the panel intake escapeway entry.
- (c) During retreat mining, two separate and distinct intake air courses shall be provided from the beginning of each longwall panel to the face.

III. Requirements Applicable to Both Development and Retreat Mining Systems

- (a) The velocity of air in the belt conveyor entry shall be 50 ft/min or greater and shall have definite and distinct movement in the designated direction. The intake air-velocity measuring station at the two-entry section neck shall activate an alarm in the manned center on the surface and on the working section when the normal section intake velocity falls to 80 ft/min or less. Upon installation of the full monitoring system, the intake air velocity measuring station shall activate the alarm when the normal intake air quantity is reduced by 9,000 ft³/min or more.
- (b) The low-level carbon monoxide system shall be capable of giving warning of a fire for a minimum of 4 hr after the source of power to the belt is removed during a fan stoppage or when the belt haulageway is examined, as provided in 30 CFR 75.1103-4(e)(1) and (e)(2).
- (c) Interim alert and alarm signal levels and administrative controls approved by the District Manager shall be established for the low-level carbon monoxide monitoring system and the operations of the diesel equipment to provide early warning of fire. The warning time provided by the system shall be maximized. Once permanently established, the Ventilation System and Methane and Dust Control Plan required by 30 CFR 75.370 shall state the established alert and alarm signal levels and all administrative

controls necessary due to the operation of the diesel equipment.

The levels established shall be as follows:

In all belt entries, the maximum alert level shall be 20 ppm and the maximum alarm level shall be 30 ppm.

In all locations other than belt entries, the maximum alert level shall be 25 ppm and the maximum alarm level shall be 30 ppm.

- (1) Methods for establishing the alert and alarm signal levels for the low-level carbon monoxide monitoring system shall include continuous recording of carbon monoxide levels measured by all sensors in order to establish a mine history for carbon monoxide.

Time delays may be incorporated as necessary, with the maximum allowable delays as follows:

When a CO sensor reaches the low-level alert concentration, there may be a maximum of 45 sec delay time before the alert signal is activated in the control room. The operator shall immediately contact persons in by the sensor in alert and initiate an immediate investigation of the cause of the alert.

During investigation of a low-level alert, all persons in the affected area shall be notified and a person shall man the phone continuously until the cause of the alert has been investigated. If no report is received from persons making the investigation within 15 min or if an additional sensor goes into alert, the visual alert on the section will be activated and all persons in by the sensor in alert shall withdraw to a safe location out by the working places. The procedures contained within this paragraph do not apply to the known nonhazardous alerts and alarms mentioned below.

If communications cannot be made or are lost, the visual alert on the section shall be immediately activated and all persons withdrawn to a safe location where communications can be established.

When a sensor reaches the high alarm level, the audible alarm on the affected section will be activated, communications shall be established, all persons shall be withdrawn out by the sensor in alarm, and the cause of the alarm shall be immediately investigated. If a hazardous condition is found and cannot be immediately controlled, the mine-wide firefighting and evacuation plan shall be implemented.

Known nonhazardous alerts and alarms caused by activities such as cutting, welding, blasting, and use of diesel to move heavy equipment other than normal daily diesel operation will not require the operator to withdraw persons in by that location provided prior notification is made by the person(s) at the source of the alarm and communications are maintained with that person throughout the duration of the alarm. The control room operator shall be notified when known nonhazardous alert and/or alarm activities have ceased. Should the concentration of CO reach the threshold limit value (TLV) of 50 ppm in the atmosphere of any work area, all affected persons shall be withdrawn.

- (2) Administrative controls shall be used to minimize the number and type of pieces of diesel equipment in the two-entry system, to notify miners on the working section when any diesel equipment is operating in the

two-entry system, and to avoid alert and alarm signals caused by operating diesel equipment.

- (3) Diesel equipment shall not be used for face haulage equipment on the working section, except that diesels may be used on the working section for cleanup or similar noncoal haulage purposes.
- (4) No later than 2 years from the date of this Order and pursuant to a schedule developed by the petitioner and approved by the District Manager, all diesel-powered equipment operated on any two-entry longwall development or two-entry longwall panel shall be equipment-approved under 30 CFR 36.
- (5) All diesel-powered equipment operated on any longwall development or longwall panel shall be provided with a fire suppression system.
 - (d) The low-level carbon monoxide devices shall provide both visual and audible signals on the working section and at a manned surface location. A visual alert signal shall be activated when the carbon monoxide level at any sensor reaches a level established in accordance with paragraph III(c) for the mine, and an audible alarm signal shall be activated when the carbon monoxide level reaches a level established in accordance with paragraph III(c) for the mine. When the carbon monoxide system gives a visual alert signal, all persons shall be withdrawn to a safe area outby the working places, and appropriate action shall be taken to determine the cause of the signal. When the carbon monoxide system gives an audible alarm signal, the mine evacuation plan required by 30 CFR 75.1101-23(a) shall be implemented.
 - (e) When miners are underground, a responsible person shall be on duty at all times at a surface location to see the visual alert and hear the alarm signals of the carbon monoxide monitoring system when the carbon monoxide reaches the levels established in paragraph III(c). This person shall have two-way communications with all working sections. When the established alert and alarm signal levels are reached, the person shall notify all working sections and other personnel who may be endangered. The person shall be trained in the operation of the carbon monoxide monitoring system and in the proper procedures to follow in the event of an emergency or malfunction and, in that event, shall take appropriate action immediately.
 - (f) The carbon monoxide monitoring system shall be capable of detecting electrical malfunctions, such as electrical short circuits, open circuits, and ground faults and, where appropriate, pneumatic malfunctions in the system.
 - (g) The carbon monoxide monitoring system shall be capable of identifying any activated sensor. A map or schematic identifying each belt flight and the details for the monitoring system shall be posted at the mine.
 - (h) The carbon monoxide monitoring system shall be examined visually at least once each coal-producing shift and tested for functional operation at intervals not exceeding 7 days to ensure that the monitoring system is functioning properly and that required maintenance is being performed. The monitoring system shall be calibrated with known concentrations of carbon monoxide and air

mixtures at intervals not exceeding 30 calendar days. A record of all inspections shall be maintained on the surface and made available to all interested persons. The inspection record shall show the time and date of each weekly inspection, monthly calibration, and all maintenance performed on the system.

- (i) If at any time the carbon monoxide monitoring system or methane monitoring system or any portion of these systems required by this petition have been deenergized for reasons such as routine maintenance or failure of a sensor unit, the belt conveyor may continue to operate provided the affected portion of the belt conveyor entry is continuously patrolled and monitored for carbon monoxide and methane by a qualified person in the following manner until the monitoring system is returned to normal operation.
 - (1) If one sensor becomes inoperative, a qualified person shall monitor at that location.
 - (2) If two or more adjacent sensors become inoperative, a qualified person shall patrol and monitor the area affected; and
 - (3) If the complete system becomes inoperative, a sufficient number of qualified persons shall patrol and monitor the belt entries of the mine so that the belt haulage entries will be traveled each hour in their entirety or qualified persons shall be located at the end of each belt conveyor flight and monitor for carbon monoxide and methane.

Each of these qualified persons shall be provided with a handheld carbon monoxide detection device and methane detection device. A carbon monoxide detection device and methane detection device shall also be available for use of each working section in the event either monitoring system is deenergized or fails.

Monitoring with handheld instruments shall not be used in lieu of installation and use of the fire detection and methane monitoring systems described in this Order.

- (j) The carbon monoxide monitoring system located in the intake escapeway shall be patrolled and monitored in the same manner as described in paragraph III(I) if the system has been deenergized for reasons such as routine maintenance or failure of a sensor unit.
- (k) MSHA is in the process of developing new conveyor belt flammability testing procedures. Once these procedures have been developed, belting acquired for replacement and extensions of the conveyor belt system shall be belting identified by the new test procedures as meeting improved flame-resistant requirements.
- (l) The details for the fire detection system and methane monitoring system, including the type of monitor and specific sensor location on the mine map, shall be included as a part of the Ventilation System and Methane and Dust Control Plan required by 30 CFR 75.370. The District Manager may require additional carbon monoxide monitors and methane monitors to be installed as part of said plan to ensure the safety of the miners.
- (m) The concentrations of respirable dust in the intake air in the belt conveyor entries used as intake air courses shall comply with the requirements of 30 CFR 70.100(b). Respirable dust samples shall be taken in all belt entries used as intake aircourses, and the location of the sampling areas shall be included as designated areas in the Ventilation System and Methane and Dust Control Plan.
- (n) Mantrip cars or personnel carriers or other transportation equipment shall be maintained on or near the working section and shall be of sufficient capacity to transport all persons who may be in the

area.

- (o) During development of the two-entry panel, a rock dusting unit shall be installed in the belt conveyor entry near the section loading point. Also, during longwall retreat mining in the two-entry panel, a rock dusting unit shall be installed on or near the last tailgate shield. These rock dusting units shall run continuously during mining operations to render inert float coal dust in these entries except when miners are performing maintenance, inspections, or other required work in these areas.
- (p) Diesel fuel shall not be stored in the two-entry panel.
- (q) Fire doors designed to quickly isolate the working sections shall be constructed in the two entries for potential use in emergency situations. Miners working in the two-entry panel shall be trained in the use of the fire doors.
- (r) The hydraulic fluid pump station for the longwall support system shall not be located in the two-entry panel and shall comply with the provisions of 30 CFR 75.345.
- (s) The permanent stoppings separating the conveyor belt entries from the intake escapeway shall be constructed of solid concrete blocks. The stoppings shall be installed with mortared joints or coated with a sealant that provides equivalent strength to a mortared joint installation. Overcasts shall be constructed of concrete block with concrete and rail or I-beam construction. No ventilation structures shall be constructed of aluminum.
- (t) A safe travelway shall be maintained for each longwall panel through the tailgate side of the longwall in accordance with 30 CFR 75.215 and 75.222. MSHA shall be notified immediately if a roof fall occurs that impedes travel in a tailgate travelway or if a travelway otherwise becomes unsafe for travel. A weekly examination of tailgate travelways shall be conducted by a qualified person and the results recorded.
- (u) Two separate communication lines shall be maintained. One shall be located in each of the two entries during development.
- (v) At least one self-contained self-rescuer shall be available for each person on the working section and shall be stored on the section while advancing the two-entry panel. During longwall retreat mining, self-contained self-rescuer units shall be stored near the face on the headgate and tailgate sides of the longwall unit at readily accessible locations. Sufficient self-contained self-rescuer units for all miners on the working section shall be stored at both locations. These locations shall be specified in the storage plan approved by the District Manager.

FIREFIGHTING AND EVACUATION PLAN

75.1101-23

Firefighting and Evacuation Plans at the Mine will consist of a program of instruction, location, and use of firefighting equipment, location of escapeways, exits and routes of travel, evacuation procedures, and fire drills, which will involve all employees.

1. All new employees undergoing orientation classes at the mine site are instructed during their underground training session on the use and locations of fire suppression equipment in the working sections, location of escapeway exits, routes of travel, evacuation procedure, and fire drills.
2. All employees will receive instruction on location and use of communications systems.
3. All miners will participate in a fire drill at intervals of not more than 90 days using attached procedures as guidelines.
4. A firefighting and evacuation program will be available on each section, which will include delegations of specific persons and responsibilities.
5. A written record shall be kept in a Fire Drill Record Book, to be located in the Safety Supervisor's office.
6. If the automatic belt fire warning system alarms, the location indicated on the monitor will be investigated immediately. If conditions are found to warrant evacuation, the firefighting plan will be implemented.
7. On units that incorporate intake/belt air, when the carbon monoxide system gives an alert or alarm signal, the following shall be followed:
 - a. Alert Level: When the carbon monoxide monitoring system gives a visual or audible alert signal, all miners in the working sections on the same split of air shall be notified immediately, and an investigation shall be conducted to determine the cause of the actuation.
 - b. Alarm Level: When the carbon monoxide system gives an audible and visual alarm signal, all miners in the same split(s) of air shall be withdrawn immediately to a safe location at least one sensor outby the sensor(s) activating the alarm, unless the cause is known not to be a hazard to the miners. When the carbon monoxide warning system gives an audible and visual alarm signal at shift change, no one shall be permitted to enter the mine except qualified persons designated to investigate the source of the alarm. If miners are en route underground, they shall be held at, or be withdrawn to, a safe location at least one sensor outby the sensor(s) activating the alarm. When a determination is made as to the source of the alarm and that the mine is safe to enter, the miners shall be permitted underground.
 - c. When the established carbon monoxide alert and alarm levels are reached, all working sections and other locations where personnel are normally assigned to work (e.g., belt transfers) will be notified.

In steps a, b, and c above, if it is determined that a fire exists and the fire is not extinguished within 15 min of discovery, all persons not required for firefighting activities shall be evacuated from the mine immediately.

8. When the carbon monoxide warning system gives an audible and visual alarm signal at shift charge, no one shall be permitted to enter the mine except qualified persons designated to investigate the source of the alarm. If miners are en route underground, they shall be held at, or be withdrawn to, a safe location at least one sensor outby the sensor(s) activating the alarm. When a determination is made as to the source of the alarm and that the mine is safe to enter, the miners shall be permitted underground.

Procedure in Case of Fire Outby Sections

1. Directly attack fire.
2. Call Warehouse to report fire:
 - a. Give your name
 - b. Location calling from
 - c. Location of fire
3. Warehouse will then:
 - a. Notify Shift Mine Manager or other appropriate personnel and shut off all belts.
 - b. Notify all areas inby the fire to immediately remove all personnel to a location outby the fire, or to a safe location at least one carbon monoxide sensor outby the carbon monoxide sensor(s) activating the alarm (if applicable).
 - c. Alert all other sections of location of fire and direct supervisors of those sections to standby telephone and be prepared to take additional firefighting equipment to fire or to evacuate mine.
 - d. Notify Mine Manager, General Mine Foreman, and Supervisor of Safety.
4. Establish ventilation to direct smoke directly to a return and keep fresh air to persons fighting the fire.
5. Call for additional firefighting equipment if needed. Direct this request to the Warehouse.
6. If fire is not extinguished within 15 min of discovery, all persons not required for firefighting activities will be removed from the mine.
7. After evacuation is completed, Shift Mine Manager will check or have checked, the check-in board to see that all tags are removed, and that all personnel not involved in the firefighting activity are out of the mine.

Procedure in Case of Fire on Continuous Miner Section

Order of Leadership

1. Foreman
2. Mechanic
3. Miner Operator
4. Miner Operator
5. Coal Hauler #1 Operator
6. Coal Hauler #2 Operator
7. Coal Hauler #3 Operator
8. Roof Bolter #1
9. Roof Bolter #2
10. Utilityman

Duties To Perform

- Supervise the operation.
- Shut power off, get tools ready; assist with getting extra hose and other firefighting equipment, if needed.
- Water hose off miner.
- Operate water valve, get extra hose from emergency sled.
- Fire extinguishers.
- Fire extinguishers.
- Ventilation and rock dust; get Vari-X foam concentrate from sled and operate the eductor.
- Phone attendant.
- Ventilation; get Vari-X from sled and operate Vari-X.
- Rock dust.

1. Directly attack fire.
2. Pull power at transformer.
3. Remove all persons from inby fire.
4. Call Warehouse and report fire.

Warehouse will then:

- a. Notify Shift Mine Manager or other appropriate personnel and shut off all belts.
 - b. Alert all underground sections of location of fire.
 - c. Notify Mine Manager, General Mine Foreman, and Supervisor of Safety.
5. Establish ventilation to keep fresh air to persons fighting fire and direct smoke to return.
 6. Call for additional firefighting equipment: material, cars, rock dust, etc.
 7. If fire is not extinguished within 15 min of discovery, all personnel not required for firefighting will be removed from the mine. Shift Mine Manager will direct evacuation of mine.
 8. After evacuation is completed, Shift Mine Manager will check, or have checked, the check-in board to see that all tags are removed and that all personnel not engaged in the firefighting activity are out of the r

Procedure in Case of Fire on Section

Order of Leadership

1. Foreman
2. Mechanic
3. Technician
4. Roof Bolter #1
5. Roof Bolter #2
6. Mini Scoop Operator
7. Remote Scoop Operator

Duties To Perform

- Supervise the operation.
- Shut power off, get tools ready; assist with getting extra hose and other firefighting equipment if needed (e.g., Vari-X).
- Phone attendant.
- Operate water valve, get extra hose, if needed.
- Fire extinguishers and fire hose.
- Fire extinguishers and fire hose.
- Get rock dust and change ventilation, if needed.

1. Directly attack fire.
2. Pull power at transformer.
3. Remove all persons from inby fire.
4. Call Warehouse and report fire.

Warehouse will then:

- a. Notify Shift Mine Manager or other appropriate personnel and shut off belts.
 - b. Alert all underground sections of location of fire.
 - c. Notify Mine Manager, General Mine Foreman, and Supervisor of Safety.
5. Establish ventilation to keep fresh air to persons fighting fire and direct smoke to return.
 6. Call for additional firefighting equipment: material, cars, rock dust, etc.

7. If fire is not extinguished within 15 min of discovery, all personnel not required for firefighting will be removed from the mine. Shift Mine Manager will direct evacuation of mine.
8. Diesel foam generator may be used to indirectly attack the fire.
9. After evacuation is completed, the Shift Mine Manager will check, or have checked, the check-in board to see that all tags are removed and that all personnel not engaged in the firefighting activity are out of the mine.

Procedure for Evacuation on Continuous Miner Section

Order of Leadership

Foreman

Mechanic

Miner Operator

Miner Operator Helper

Roof Bolters

Coal Hauler Operators

Utilityman

Duties To Perform

Direct the procedure. First-aid kit and escape map.

Shut off power and take nails, hammer, and spads, etc.

Saw, pick, and shovel.

Sledge hammer and extra SCSRs.

Spads, nails, brattice cloth.

Get all lunch buckets and clothing from dinner hole.

Brattice cloth and first-aid equipment.

Know Your Escape Routes:

1. Account for all of the personnel on the section.
2. Be sure that each miner has a self-rescuer, and take all the extra rescuers with you.
3. Explain the escape route to the entire crew. Direct air to return not designated as alternate escapeway. Attempt to travel the primary escapeway. If smoke is encountered, proceed to the alternate escapeway. The foreman will lead the group with second-in-command bringing up rear to prevent stragglers.
4. Move fast, but do not run. At frequent intervals, check the manddoors to see if you are past the fire area. When past the fire area, you may travel in either escapeway and continue exiting the mine.

Procedure for Evacuation on CM Section

Order of Leadership

Foreman

Mechanic

Technician

Roof Bolter #1

Roof Bolter #2

Mini Scoop Operator

Remote Scoop Operator

Duties To Perform

Direct the procedure. First-aid kit and escape map.

Shut off power and take nails, hammer, and spads, etc.

Saw, pick, shovel, and sledge hammer.

Spads, nails, and brattice cloth.

Get extra SCSRs.

Get all lunch buckets and clothing from dinner hole.

Brattice cloth and first-aid equipment.

Know Your Escape Routes:

1. Account for all of the personnel on the section.
2. Be sure that each miner has a self-rescuer, and take all the extra rescuers with you.
3. Explain the escape route to the entire crew. Direct air to return not designated as alternate escapeway. Attempt to travel the primary escapeway. If smoke is encountered, proceed to the alternate escapeway. The foreman will lead the group with second-in-command bringing up rear to prevent stragglers.
4. Move fast, but do not run. At frequent intervals, check the manddoors to see if you are past the fire area. When past the fire area, you may travel in either escapeway and continue exiting the mine.

FIREFIGHTING AND EVACUATION DUTIES

Precautions:

In the event that a miner should smell smoke, sees a fire, or possibly identifies a fire prior to an alarm, the miner will communicate this immediately and follow the Firefighting and Evacuation Plan.

Firefighting Duties:

Each miner will be instructed in the following firefighting duties:

I. Continuous Miner Sections (Production)

a. Section Foreman

1. The foreman is responsible for all firefighting evacuation and communication procedures.
2. The section power and equipment are to be secured.
3. Section ventilation changes are to be directed by the foreman.
4. Assembly of miners for evacuation is to be directed by the foreman.

b. Miner Operator

If the fire is on the miner:

1. Deenergize the miner (on board).
2. Activate the fire suppression.
3. Locate and use appropriate firefighting equipment.

c. Miner Helper

If the fire is on the miner:

1. Deenergize the trailing cable.
2. Notify the foreman.
3. Locate and use appropriate firefighting equipment.

If the fire is on the section, the miner operator and helper are to:

1. Secure the miner.
2. Deenergize the trailing cable.
3. Disconnect the miner water hose, attach fire nozzle, and await firefighting instructions.

d. Shuttle Car Operations

If the fire is on the shuttle car:

1. Set the brakes.
2. Deenergize the on-board power.
3. Activate the fire suppression.
4. Deenergize the trailing cable.
5. Locate and use appropriate firefighting equipment.
6. Notify the foreman.

If the fire is on the section:

1. Secure the car.
2. Deenergize the trailing cable.
3. Locate appropriate firefighting equipment to assist in firefighting and assemble at the crew station.

e. Roof Bolter

If the fire is on the roof bolter:

1. Deenergize the bolter (on board).
2. Activate the fire suppression.
3. Locate and use appropriate firefighting equipment.

f. Roof Bolter Helper

If the fire is on the bolter:

1. Deenergize the trailing cable.
2. Notify the foreman.
3. Locate and use appropriate firefighting equipment.

If the fire is on the section, the roof bolter and helper are to:

1. Secure the bolter.
2. Locate appropriate firefighting equipment to assist in firefighting and assemble at the crewstation.

g. Bratticeman

If the fire is on the section:

1. Locate appropriate firefighting equipment and assemble at the crewstation.
2. Notify and assemble any nonproduction miners on the section.

h. Mechanic

If the fire is on the section:

1. Assemble appropriate firefighting equipment.
2. Determine that section power is secured.
3. Assist the foreman as directed.

i. Material Man

If the fire is on the section:

1. Start and prepare the mantrip for evacuation.
2. Assemble SCSR units in storage for use.
3. Establish communications with the surface, shift foreman, or designated person in charge.

If the fire is not on the section:

1. Notify the section foreman of the fire.
2. Establish communications with the surface.
3. All face personnel are to assemble at the crewstation.
4. All persons are to evacuate the mine or follow firefighting instructions from the shift foreman or designated person in charge.

II. Continuous Miner Section (Maintenance Shift)

a. Maintenance Foreman

1. The foreman is responsible for all firefighting and evacuation procedures.
2. The section power and equipment are to be secured.
3. Section ventilation changes are to be directed by the foreman.
4. Assembly of miners for evacuation is to be directed by the foreman.

b. Mechanics

If the fire is on equipment being serviced or repaired or on service equipment:

1. Deenergize the machine (on board).
2. Activate the fire suppression.
3. Deenergize the trailing cable.
4. Locate and use appropriate firefighting equipment.
5. Notify the foreman.

III. Longwall Section (Production)

a. Section Foreman

1. The foreman is responsible for all firefighting and evacuation procedures.
2. The section power and equipment are to be secured.
3. Section ventilation changes are to be directed by the foreman.
4. Assembly of miners for evacuation is to be directed by the foreman.

b. Shear Operators

If the fire is on the shear:

1. Deenergize the shear (on board).
2. Activate the suppression.
3. Notify the foreman.
4. Locate and use appropriate firefighting equipment.

If the fire is on the face:

1. Notify the foreman.
2. Leave shear sprays on.
3. Activate and use an SCSR unit.
4. Move to the stageloader and assemble at the crewstation.

c. Shield Operators

If the fire is inby:

1. Move to the crewstation.
2. Obtain appropriate firefighting equipment to assist in firefighting.
3. Await instructions.

If the fire is outby:

1. Notify the foreman.
2. Activate and use an SCSR unit.
3. Move to the stageloader and outby to the crewstation.
4. Locate and use appropriate firefighting equipment.

d. Headgate Operator

1. Deenergize the longwall at the stageloader.
2. Notify the foreman and crew.
3. Use a fire extinguisher on a stageloader fire.
4. Establish communications with the surface.
5. Notify the shift foreman or person in charge.
6. Remain in contact with the surface.
7. Relay information about the fire.

e. Mechanic

1. Disconnect power at power center.
2. Locate all available fire extinguishers and move them to the stageloader.

f. Utilityman

1. Start and prepare the mantrip for evacuation.
2. Assemble SCSR units in storage for use.
3. Notify and assemble any nonproduction miners on the section.

IV. Outby Areas

- a. Use any firefighting equipment that is readily available.
- b. Disconnect power from the affected area or equipment.
- c. Notify the surface of the fire and conditions.
- d. Obtain additional firefighting equipment for use on the fire.

V. Shift Foremen

- a. Evacuate all miners not required for firefighting.
- b. Coordinate and dispatch personnel and equipment for firefighting.
- c. Implement the Notification Plan.
- d. Account for the location of all miners on shift.

Firefighting and Mine Rescue Mobilization:

Mine rescue and/or firefighting crews will be notified by pager or telephone, as appropriate, and will be assembled at the mine rescue station.

Diesel mantrips and other diesel equipment that might be available will be assembled at the bathhouse area to be used as transportation of mine rescue crews, rescue apparatus, firefighting crews, and fire suppression equipment.

All firefighting operations shall be conducted from the fresh air side of a fire.

Mine rescue teams will not operate inby a fire without specific permission of the mine emergency controller.

Self-Rescuer Program of Instruction:

The Program of Instruction will be presented to all experienced miners at least annually and will be included as part of the 8-hr annual training program required by 30 CFR 48.8(a).

The Program of Instruction will be presented to newly hired miners and will be presented as part of the training required for inexperienced miners and newly hired experienced miners prior to assigning them to work duties.

Self-Contained Self-Rescuer:

The recommended "hands-on" training method will be used to train miners on the SCSR units.

PROCEDURE AND DUTIES FOR FIRE

To follow up on the recent training you received on the Vari-X foam generator, the following procedures have been developed to communicate to all employees their responsibilities in the event of a fire on a section.

ORDER OF LEADERSHIP	DUTIES TO PERFORM
1. Foreman	Supervise the operation.
2. Mechanic	Shut off power, get tools ready.
3. Miner Operator	Water-hose off miner.
4. Miner Operator	Operate water valve, get extra hose from emergency sled.
5. Coal Hauler #1 Operator	Fire extinguishers.
6. Coal Hauler #2 Operator	Fire extinguishers.
7. Coal Hauler #3 Operator	Ventilation and rock dust; get Vari-X foam concentrate from sled and operate the eductor.
8. Roof Bolter #1	Phone attendant.
9. Roof Bolter #2	Ventilation/get Vari-X from sled and operate Vari-X.
10. Utilityman	Rock dust.

1. Directly attack fire.
2. Pull power at transformer.
3. Remove all persons from inby fire.
4. Call Communications Center/Warehouse and report fire. Communication Center/Warehouse will:
 - a. Alert all underground sections of location of fire.
 - b. Notify Mine Manager, Mine Superintendent, and Health & Safety Supervisor.
 - c. Notify Shift Supervisor to alert idle crews not working on the section of the fire.
5. Establish ventilation to keep fresh air to persons fighting fire, and direct smoke to return.

NOTE: All fire hose outlets are equipped with an adapter to allow attachment of a 1.5-in fire hose. Extra

adapters are located in the bottom of each fire hose barrel and on the emergency sled should one of the outlet adapters be damaged.

SPECIFIC INDIVIDUAL DUTY LABELS IN THE EVENT OF A FIRE

In case of FIRE ON THE SECTION

REPAIRMAN-----Call communications
 MINER OPERATOR-----Shut off section power
 MINER HELPER-----Water hose and rock dust
 SCOOP OPERATOR-----Water hose and rock dust
 UTILITYMAN-----Water hose and rock dust
 ROOF BOLTERS-----Fire extinguishers
 SHUTTLE CAR OP'S-----Assist as directed
 SECTION FOREMAN-----Direct firefighting

Report Status of Fire to Communications
 Coordinator Every 10 Minutes.
 If Fire is Not Under Control in
 15 Minutes, Evacuate the Section!

WHEN ESCAPE IS CUT OFF

1. **BARRICADE**
2. **LISTEN** for 3 shots, then...
3. **SIGNAL** by pounding hard 10 times
4. **REST** 15 min, then **REPEAT** signal until...
5. **YOU HEAR 5 SHOTS**, which means you are located and help is on the way.

LONGWALL FIREFIGHTING PLAN

IN THE EVENT OF A FIRE, THE LISTED PEOPLE
 WILL ASSUME THE FOLLOWING DUTIES

Longwall repairman: Deenergize all power, then proceed
 to
 the telephone and coordinate all phone messages.

Other personnel on section: Assemble at fire skid.

Operators: Begin laying 1-3/4-in hose to fire areas.

Utilitymen: Begin laying 5-in feeder hose to fire area.

Supervisor: Contact all employees and communications.

PROCEDURES

CHECK THAT:

1. All power has been removed.
2. Communications has been notified.
3. All personnel are assembled at the fire skid.
4. Notify Communications that all employees are
 accounted
 for and action to be taken.
5. Advise employees of the plan of attack and
 firefighting.
6. Report status of fire to Communication Coordinator
 every 10 min. If fire is not under control in 15
 min,
 evacuate the section.

MINE FIRE TRAINING PROGRAM

1. Mine fire training can be divided into the following three areas:
 - a. Basic training for all miners.
 - b. Intermediate training for mine fire brigades/mine rescue.
 - c. Advanced training for fire brigades/mine rescue.

2. The basic fire training for all miners may consist of the following and could be conducted aboveground:
 - a. Basic fire chemistry (classes of fires, fire triangle, smoke, heat).
 - b. Assessment of containability of fightable fires.
 - c. Types of portable fire extinguishers, hose lines, and water nozzles.
 - d. Extinguishing a liquid fuel and solid fuel fire with portable fire extinguishers.
 - e. Extinguishing a solid fuel fire with water lines.
 - f. Paper-and-pencil simulations on fighting a small mine fire.
 - g. Mine evacuation procedures.
 - h. Understanding the operation of fire sensors (thermal, smoke, CO).

3. Intermediate training for mine fire brigades/mine rescue basic fire training, plus the following:
 - a. Use of handheld and large foam generators.
 - b. Turnout gear and equipment used for firefighting.
 - c. Fighting fires in smoke, wearing SCBAs.
 - d. Paper-and-pencil simulations on fighting fires outby the section.
 - e. Firefighting strategies: underground fire houses, fire cars, or trailers.

4. Advanced firefighting training would include all of the skills acquired in the basic and intermediate levels, plus the following:
 - a. Combating simulated mine fires in ventilated entries with portable and wheeled fire extinguishers, water lines, and foam generators. The fires would include equipment fires, conveyor belt fires, etc.
 - b. Erecting seals to isolate fire areas.
 - c. Examining the effect of ventilation on fires and regulating air during a fire.

FIRE DRILL SIMULATIONS

Unannounced simulation fire drills were conducted. The drills were designed to test the response actions of production crew personnel, including the Section Foremen responding to a fire/smoke emergency. Since each unit has unique mining and ventilation systems, drill locations were selected based on greatest potential for occurrence. Each drill lasted approximately 15 to 20 min, and a critique was held immediately following the drill. These drills were conducted concurrent with MEO requirements designed to evaluate OIMS System 10-2 - Emergency Response. This memo includes a brief description of each simulation scenario and documents key recommendations made by observers and participants.

Drill Scenario Unit #3:

At 9:45 a.m., the Section Foreman observed smoke leaking through the flame-resistant isolation curtains located at the Unit Battery Charging Station. The smoke was contaminating entry No. 2, which is the intake airway for that section.

Summary of Key Response Activities:

Section Foreman:

- Notified Communications of situation and advised him to notify Fire Brigade.
- Advised Scoop Operator to deenergize unit power center.
- Notified crew members to evacuate face area and assemble outby smoke location.

Crew Members:

- Four members brought fire extinguishers to smoke location.
- One member ensured that incoming power cable was deenergized prior to entering fire location.
- Several crew members installed line brattice to short-circuit smoke to return airway.
- Several crew members obtained SCSRs from storage location at power center and carried them to the fire location.

Critique:

- The crew/FLS responded promptly and orderly, although one crew member was not aware of emergency situation.
- Many crew members were aware of the unit fire skid, but were not familiar with assembly procedures of the advanced firefighting equipment.
- One fire extinguisher brought to the fire location was in very poor condition (if even operable).

Drill Scenario Unit #2:

At 11:10 a.m., the Section Foreman discovered smoke on the inby end of the unit power center located in entry No. 5 several crosscuts outby the face area.

Summary of Key Response Activities:**Section Foreman:**

- Notified Communications of the situation and advised him to notify the Fire Brigade.
- Notified section repairman to deenergize unit power center.
- Notified crew members to evacuate the face area via the intake escapeway to a location just outby the smoke area.
- Advised responding crew members to remove smoke by coursing fresh air from an adjacent intake airway using line brattice.

Crew Members:

- Several members brought fire extinguishers to the smoke location.
- One crew member obtained a roll of line brattice.
- One crew member brought pipe wrenches to break the water hose so that water would be available, if need
- Remaining crew members (less one who was not informed of the situation) assembled outby the fire area to assist the initial responders.

Critique:

- Crew members responded promptly and took immediate action.
- As stated above, one crew member was not informed of the situation.
- Crew members were not aware of unit fire skid location or assembly procedures required to use their advanced firefighting equipment stored on the skid.

Drill Scenario Unit #1:

At 12:15 p.m., the Section Foreman observed smoke entering the section from the No. 2 entry. Upon investigation, he discovered that the scoop tractor was on fire. The unit had just begun a power and belt retraction.

Summary of Key Response Activities:**Section Foreman:**

- Notified Communications of the situation and advised him to assemble the Fire Brigade.
- Notified section repairman to deenergize the unit power center.
- Notified crew members to evacuate the face area via escape routes and to approach the fire area from fresh air (outby) side.

Crew Members:

- Three members obtained fire extinguishers from various locations and used them to extinguish the fire from the fresh air side.
- Three other members began laying fire hose to the fire location. Hose was obtained from the unit fire ski

- One non-crew member carried SCSRs from the headgate to the fire area.
- Remaining crew members assembled outby the fire location to form a labor pool.

Critique:

- Crew members responded promptly and took immediate action.
- Two surveyors working in the section were not notified of the emergency. After observing the crew members exiting the face area, they decided to investigate.
- Several crew members stated that had they been operating the longwall and working on the face under similar circumstances, they would evacuate via the tailgate escapeway. It was suggested that all crew members using this escape route notify Communications so that the Section Foreman and responding personnel were aware of their location.

Areas for Improvement

IMPROVEMENT ACTIVITIES	RESPONSIBILITY	TARGET DATE
Identify the best means to notify persons working in the unit of an emergency.	WTC	<i>Month/year</i>
Evaluate the current SCSR storage location in all units, and determine if a better location exists for each working section.	Safety Department	<i>Month/year</i>
Evaluate the current SCSR storage containers for the best possible protection from damage and/or contamination.	Safety Department	<i>Month/year</i>
Train all crew members on proper assembly procedures for advanced firefighting equipment stored in the unit fire skids.	Fire Brigade	<i>Month/year</i>
Conduct unannounced fire drills at least once per year.	Safety Department/ Mine Superintendent	Begin during <i>month/year</i>

SELECTION PROCEDURES FOR NEW EMERGENCY RESPONSE MEMBERS

1. Post notice on bulletin boards informing all employees of any vacancy.
 - Ⓒ The vacancy notice will be posted by management in a conspicuous place at the mine for a period of 5 calendar days, but no less than 3 production days. All employees absent from work due to illness or other legitimate reasons during the posting period will be notified by management of the vacancy. An employee on leave of absence working for local, district, or International Union, if he/she so requests, shall be notified by management of the vacancy. The employer will, on the date of the posting, give notice to such employees of the vacancy by certified mail to their last known address. (This is the same as the contract job bidding procedures.)
 - Ⓒ Vacancy notices will also be posted on the salaried bulletin boards located in foremen's conference room and in the mail room.
 - Ⓒ All department heads and shift managers will be given copies of the notice of vacancy and will advise all minorities, women, and staff personnel of the vacancy. This will ensure that all affirmative action guidelines are met. Each manager will return to the Training Coordinator the list of minorities and/or staff personnel with the date that each employee was advised of said vacancy. This list shall be retained for the current year plus 2 years.
2. Notices should direct interested employee(s) to the Training Coordinator in charge of the emergency response teams.
3. The Training Coordinator will briefly explain what is expected of the particular emergency response team members. This should include, but is not limited to, physical expectations, training requirements, and member duties. At this time, the applicant will be given a questionnaire to complete and return to the Training Coordinator within a specified time.
4. Those employees still interested will be instructed to sign a registration form located in the Training Office. This list will be available for 2 weeks after notice of vacancy is taken down.
5. This list will be reviewed by the Human Resources Supervisor to determine if there are any applicants that are covered by the Americans with Disabilities Act. If so, the Human Resources Supervisor will advise the Training Coordinator.

6. After registration is closed, each interested employee will be interviewed for the position. Two interviewers will be present; one will be the Training Coordinator and another interviewer to be named.
7. The Accident and Absenteeism history will be pulled from the archives and will be reviewed and discussed with the individual. This history should be pulled for the current year plus 2 previous years.
8. Interviewer should tell in detail what the expectations are of the particular response team members. Also, the interviewer should ask what the applicant expects to get from being a response team member.
9. Applicants will be asked if they have any experience as firefighters, rescue team members, or members of any other emergency response teams.
10. The interviewers will use a summary form to rate the applicants. The name of the selected candidate shall be submitted to the Mine Superintendent for approval. The remaining pool or list of candidates will be retained for 1 year. Any vacancies that occur within this period will be filled from the applicants listed in this pool.

REQUIREMENTS FOR EMERGENCY RESPONSE TEAMS

INITIAL MEDICAL EVALUATION

Step 1 - Health Risk Assessment (HRA)

- ☐ Required of all response team members.
- ☐ Will be used for informational purposes only.

Step 2 - Health Risk Followup and Additional Testing

- ☐ Present results of the Health Risk Assessment.
- ☐ Complete the medical questionnaires.
- ☐ Lab work - blood and urinalysis.
- ☐ Conduct pulmonary function.

Step 3 - Doctor's Examination

- ☐ Continue to use the National Institute for Occupational Safety and Health form for mine rescue personnel.
- ☐ Perform the Step Test.
- ☐ Recommend further evaluation(s) if indicated.
- ☐ Stress test required if over age 45.
- ☐ Complete Notification of Exam Results Memorandum.

PERIODIC MEDICAL EVALUATION

- ☐ Minimum fitness requirements should be met at all times.
- ☐ Same format as the initial evaluation, except no Health Risk Assessment.
- ☐ Continue annual National Institute for Occupational Safety and Health exam for mine rescue team members.
- ☐ Medical evaluation every 3 years if under age 45.
- ☐ Evaluation every 2 years if age 45 or older.
- ☐ Members will complete the cardiovascular risk analysis questionnaire in the off years.

TEAM MEMBER THAT FALLS SHORT OF MINIMUM STANDARD

- ☐ Notification of Exam Results Memorandum forwarded to employee and Health Risk Assessment (HRA) 7

- C HRA Team includes Training Specialist, Safety Superintendent, and Administration Superintendent.
- C HRA Team makes recommendation to Operations Superintendent.
- C Doctor must reexamine individual before he/she can reinstated on team or returned to normal duty.

PROCEDURES FOR FIT TESTING EQUIPMENT

- C Annual fit test required for face masks.
- C Beard/facial hair
 - Fire Brigade members - no beards allowed
 - Mine Rescue members - must remove beards for annual fit testing and prior to emergency response.

TRAINING OF FIRE BRIGADE MEMBERS

Fire brigade members are trained in coal mine firefighting and coal mine fire prevention. In the event of a fire, their training skills will be utilized in controlling a fire. This training is done by the methods listed below:

1. Monthly meeting in which various techniques are practiced and discussed.
2. Outside experts are invited to lecture and train the fire brigade.
3. Certain members of fire brigade are chosen to attend training sessions provided by government agencies, schools, and fire services. These sessions usually include classroom lectures, discussion, and a liberal amount of “hands-on” training.

These new skills and techniques are then shared with the rest of the fire brigade and mine rescue team members. The members are asked to write a brief paper describing and explaining what they had seen, heard, and done.

FIRE BRIGADE MEMBERS TRAINING OTHER MINERS

Safety management here feels it is best to utilize fire brigade and mine rescue team members to train all employees in the areas of fire prevention, firefighting techniques, and firefighting equipment. Since we are trained in these areas on a regular basis, safety management feels that we are best equipped to share our knowledge and experience with our coworkers. At our annual refresher, we have been asked to be instructors on such items as the foam generator, handheld fire extinguisher, and hose and nozzle handling techniques.

STANDARD OPERATING PROCEDURES FOR FIRE ATTACK OF THE FIRE BRIGADE

1. Contact Communication Coordinator

- Arrival time
- Brigade members on scene
- Conditions upon arrival
- Action to be taken

2. Establish command

- Establish a fresh air base
- Secure evacuation transportation
- Form a plan of attack
- Check equipment
- Radio check

3. Execute attack

- Rescue
- Exposures
- Confinement
- Extinguish
- Overhaul

4. Terminate incident

DONNING PROCEDURES FOR PA-80 SCBA

1. Push demand regulator to donning mode.
2. Turn cylinder valve on and compare gauges.
3. Don the SCBA.
4. Don the face mask.
5. Insert the demand regulator in face mask.
6. Check positive pressure.
7. Check bypass function.
8. Check face mask seal. Shut cylinder valve off. Watch chest gauge fall to zero and listen for warning whistle.
9. Turn O₂ valve back on and watch gauge.
10. Put Nomex hood over face mask.