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Office of the Administrator
Coal Mine Safety and Health

REPORT OF INVESTIGATION
DECEMBER 7, 1992
UNDERGROUND COAL MINE EXPLOSION
#3 MINE - ID. NO. 44-06594
SOUTH MOUNTAIN COAL CO., INC.
NORTON, WISE COUNTY, VIRGINIA

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OVERVIEW

Abstract of Explosion

At approximately 6:15 a.m., December 7, 1992, an explosion occurred on the 1 Left section of Southmountain Coal Co., Inc.'s (Southmountain), #3 Mine. Eight miners were killed and another miner working in an outby area was injured. The names of these miners are listed in Appendix A.

The bleeder system of the pillared 1 Right off 1 Left, 2 Right off 1 Left, and 1 Left sections was not examined or maintained to continuously move methane-air mixtures away from the active faces (See map, Appendix E). The condition of the mine roof in the bleeder entry had deteriorated to the point where the bleeder entry had not been examined for several weeks. Methane, liberated primarily from the closely overlying Kelly Rider Seam, accumulated in the pillared areas and bleeder entry. Ventilation controls, both permanent and temporary, on the active working section had been removed or were not maintained. This action allowed the methane to migrate from the pillared area and bleeder entry to the No. 1 entry and in the No. 2 crosscut between Nos. 1 and 2 entries. Other factors included the dip of the coal seam, the drop of the barometric pressure before the explosion, the possibility of water accumulations and roof falls occurring within the pillared areas and bleeder entry.

The methane was ignited on the 1 Left section in the No. 2 crosscut between the Nos. 1 and 2 entries by an open flame from a butane cigarette lighter. The methane explosion resulted in sufficient forces and flames to suspend and ignite coal dust in 1 Left. The coal dust explosion continued to propagate the entire distance of the No. 1 West Main entries to the surface area of the mine.

Background

The #3 Mine, I.D. No. 44-06594, was operated by Southmountain, a subsidiary of Apple Coal Co. & Affiliates, Inc. The mine opened in 1990 and was located in Wise County, Virginia, approximately 7 miles northeast of Norton, Virginia, on Route 620.

The principal management officers of the mine at the time of the explosion were:

William Jack Davis	President
Bobby Kyle	Vice President
Deborah K. Davis	Secretary/Treasurer
William Ridley Elkins	Consultant for Apple Coal Co. & Affiliates, Inc.
Donnie F. Short	General Superintendent
Freddie Deatherage	Mine Superintendent (Also fulfills requirements of Mine Foreman)

Although William Ridley Elkins' official title is listed as a "Consultant", based on the information obtained during the investigation, MSHA considers Mr. Elkins to be a mine operator with full authority and responsibility to control all aspects of the mining operations at the #3 Mine.

The mine was opened into the Imboden Seam by four drift entries. The seam varied in height from five to seven feet. The methane liberation was approximately 188,000 cubic feet in a 24-hour period as measured in October 1992.

The mineral rights where the Southmountain #3 Mine was located are owned by Penn Virginia Resources Corporation. Penn Virginia leased the coal mineral rights on this property to Virginia Iron, Coal and Coke Company (VICC). VICC engaged Southmountain to mine the coal. VICC prepared and furnished mining plans to Southmountain to be followed during mining operations.

At the time of the explosion, the mine employed 34 miners, 31 underground and 3 on the surface. The active section was located approximately 6,000 feet from the surface. The elevation from the portals to the 1 Left section had dropped approximately 400 feet. There was one continuous mining unit working two shifts per day, producing an average of 1,500 tons of raw coal per 24-hour period. Maintenance was performed on the evening shift (3:00 p.m. to 11:00 p.m.). Coal was being produced at the time of the explosion. The normal work week was six days per week; but, due to a request for additional tonnage by VICC, the mine produced coal seven days the first week of December 1992. On December 7, 1992, the midnight shift had worked on eight consecutive days.

The Mine Safety and Health Administration (MSHA) completed a safety and health inspection (AAA) of the #3 Mine between October 20, and 27, 1992. An electrical spot inspection was conducted on November 30, 1992.

EVENTS PRECEDING THE EXPLOSION

On Sunday, December 6, 1992, at 7:00 a.m., the day shift crew of 11 men under the supervision of Paul Ramey, Section Foreman, entered the mine. The crew traveled in a rail mounted battery-powered mantrip to the 1 Left section. Ramey examined the section and did not find any hazards. Mining commenced in the No. 6 entry on pillars located between the Nos. 2 and 3 cross-cuts. Five cuts were mined in the left and right pillars in No. 6 entry. The continuous mining machine was moved to the No. 5 entry where approximately six cuts were mined. Mining continued without incident until the shift ended at 3:00 p.m. with the exception of a steering arm that broke on a shuttle car ten minutes before the end of the shift. Ramey stated he did not notice anything unusual during the shift except for some loud noises (thumps) originating from either the mine roof, floor, or coal pillars in the No. 5 entry.

According to Ramey methane was not encountered during the shift and all the ventilation controls were in place. He also stated that ventilation controls were not changed during the shift. He took an air measurement in the No. 1 entry and recorded 23,200 cubic feet per minute (cfm) in the preshift record book. The preshift examination was conducted from 2:10 p.m to 2:30 p.m.

Freddie Deatherage, Superintendent, was in the mine during the day shift on December 6, 1992. Deatherage entered the mine and traveled to the No. 4 belt drive where he parked the personnel carrier and walked to the section. He traveled the section and walked the return entries out to the No. 4 belt drive. Deatherage returned to the section where he, Ramey, and Jackie Davis, Electrician, worked late to repair the steering arm on the shuttle car. They arrived on the surface at approximately 4:10 p.m. Deatherage stated he did not observe anything out of the ordinary and considered it a normal production shift. Ramey did not call out the results of the preshift examination prior to the oncoming shift going underground.

At 3:00 p.m., the maintenance crew of four miners under the supervision of Kenneth Brooks, Section Foreman, entered the mine. The crew traveled in a rail mounted battery-powered mantrip to the 1 Left section. The results of the preshift examination were communicated underground to Brooks by Ramey. Brooks examined the section and instructed David Goode and Gleason Silcox, General Inside Laborers, to service the continuous mining machine. He

also instructed them to take down some loose coal ribs and reinstall four check curtains which had been torn down by small pieces of falling rock. While Goode and Silcox were servicing the continuous mining machine located in the No. 4 entry, they heard a loud thump. The thump shook the area and Goode and Silcox ran from the area until they determined there was not any danger. This was the only abnormality noted during the shift.

During the servicing process, the continuous mining machine was energized to rotate the ripper head in order to change bits. Goode stated the methane monitor readout was functioning properly. However, he did not observe the condition of the monitor sensor. After Goode and Silcox serviced the continuous mining machine, Brooks told Goode to go to the surface and get a load of rock dust and apply it to the No. 3 entry of the Mains where the belt/track was located. Goode rock dusted in the No. 3 entry from the portal to the No. 32 crosscut.

Goode returned to the section at 8:00 p.m. Brooks and the remaining members of the crew were moving belt and belt structure which had been stored in the Nos. 1 and 2 entries of the Mains to outby crosscuts in the No. 1 entry. A new section was to be started, left off the Mains, when mining was completed in 1 Left.

Brooks used the scoop to clean the Nos. 1 and 2 entries beginning at the No. 83 crosscut in the Mains inby the coal feeder. The cleaning was done in preparation for pillar recovery in this area of the Mains following completion of mining in 1 Left. Brooks stated that the ventilation controls were not disturbed during the cleanup activities and check curtains were always replaced when they were pulled down by the scoop.

Brooks conducted the preshift examination for the oncoming shift between 9:30 p.m. and 10:30 p.m. During the examination methane was not encountered. However, Brooks did not go into the Nos. 1, 5, and 6 entries of 1 Left during the preshift examination. He recorded an air measurement of 29,460 cfm in the No. 2 entry of 1 Left. Brooks and the evening shift crew arrived on the surface about 11:00 p.m. The results of the preshift examination were communicated to Norman Vanover, Section Foreman, when Brooks arrived on the surface.

Brooks also told Vanover that Deatherage had left instructions to move the power center back one crosscut when the continuous mining machine was moved to the right side of the section. Brooks had not made any preparations to move the power center. During the investigation it was found that the high voltage cable had been pulled back and placed in a figure eight position. It appeared the preparation to move the power center was done on the midnight shift.

The midnight shift crew normally consisted of 11 underground employees, but only nine worked the night of the explosion. At 11:00 p.m., the midnight shift crew entered the mine under the supervision of Vanover. Eight of the men were section employees and one was a belt attendant. The crew produced coal in 1 Left. The shift was almost complete when a methane and coal dust explosion occurred. The approximate time of the explosion was 6:15 a.m., December 7, 1992.

George Phillip Shortt, Outside Loader Operator, stationed on the mine surface, did not recall anything unusual during the shift. Shortt was transferring coal from the stacker belt to the coal stockpile. At approximately 6:20 a.m., Shortt noticed the surface lights were out but had neither seen nor heard anything abnormal. He traveled approximately 150 feet toward the mine portals where he observed signs of the explosion. At that time, he saw Robert Kevin Fleming, Underground Belt Attendant, exiting the mine from the No. 3 entry. Fleming had suffered burn injuries to the hands and face from the explosion. Shortt transported Fleming to the hospital for medical attention.

Fleming's shift began at 11:00 p.m. and continued without incident until the time of the explosion. His work activities consisted of servicing and cleaning the belts. When the explosion occurred, he was at the No. 2 belt drive. The forces of the explosion propelled Fleming approximately two crosscuts before he could get back on his feet. He did not see any flame but reported seeing dust and feeling heat. Fleming found the water line which he used to establish direction and crawled to the surface where he was met by Shortt.

As Shortt was transporting Fleming to the hospital they met Deatherage who was on his way to work. Shortt informed Deatherage of the explosion. Deatherage traveled to the mine and, during his assessment of the damage, he observed that the commercial telephone had been destroyed. Leaving the mine property to access a telephone, he met Jackie Davis who was on his way to work. Deatherage instructed Davis to go to the nearby Plowboy Coal Company mine and call the authorities and company officials.

Shortt and Fleming indicated that coal production had been normal during the shift. Neither had communicated with Vanover or any other member of the underground crew during the midnight shift.

RECOVERY OPERATIONS

At approximately 7:10 a.m. on December 7, 1992, the Norton, Virginia, MSHA Subdistrict Office, received a telephone call from William Ridley Elkins, Consultant for Apple Coal Co. & Affiliates, Inc., that an explosion had occurred at Southmountain, #3 Mine. MSHA personnel were immediately dispatched to the mine to secure the scene and assist in the recovery operations. Mine rescue teams were alerted of the explosion. MSHA Headquarters in Arlington, Virginia was notified and subsequently dispatched MSHA's Mine Emergency Unit and Mine Emergency Technology Team to the site. The Westinghouse Electric Company and the Montgomery County (Maryland) Fire Department were contracted to provide and operate a seismic locating system and borehole camera.

Elkins, Donnie Short, General Superintendent, Deatherage, and various laborers arriving for the day shift, observed that an explosion had occurred. There was black smoke exiting the Nos. 3 and 4 entries and destruction was evident on the surface. The portal canopies were damaged, the belt head and structure were damaged, and the fan housing and explosion doors were destroyed. In addition, the motor barn/office building located in line with the No. 2 entry was destroyed and debris from the building was carried approximately 1,000 feet. Vehicles parked approximately 200 feet from the openings had windows blown out. The surface electrical installations had been damaged. A thin layer of black dust had settled over the entire area.

Eight miners were unaccounted for after the explosion. It was speculated that the eight miners were on the 1 Left section.

At about 8:00 a.m. rescue and recovery operations began and the following took place:

1. A command center was organized at the mine trailer with the following responsible officials from each organization identified as the spokesmen: Donnie Short from Southmountain, Harry Childress from Virginia Department of Mines, Minerals, and Energy (VDMME), and Michael Lawless from MSHA. A 103(k) Order was issued by MSHA and the operator was informed that their rescue and recovery plans had to be approved by MSHA who would consult with the VDMME as provided for by Section 103(k) of the Act.
2. Once mine rescue teams arrived, mine officials, MSHA, and VDMME personnel began briefing and organizing the team activities.

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2. Once mine rescue teams arrived, mine officials, MSHA, and VDMME personnel began briefing and organizing the team activities.

3. Continuous gas testing apparatus was obtained from MSHA's Norton District Office and preparations were made to monitor the mine atmosphere.
4. Efforts were started to reset the mine fan and restore electric power.

About 9:00 a.m., the Westmoreland Mine Rescue Team, the Paramont Mine Rescue Team, and the Mine Technology Mine Rescue Team had arrived on site. The Clinchfield Mine Rescue Team arrived a few hours later. Initial readings from the No. 4 entry at 10:00 a.m. were 12,800 parts per million (ppm) carbon monoxide, 17.3 percent oxygen, and 0.7 percent methane. The Mine Technology Mine Rescue Team was sent underground to obtain air quality readings and install sampling tubing in the Nos. 3 and 4 entries for continuous gas monitoring. Sample tubing was hung to approximately the No. 3 crosscut in the Nos. 3 and 4 entries and continuous monitors were set up on the surface. Appendix B is a list of Mine Rescue Team Members and others who participated in mine rescue and recovery and establishment of ventilation.

After an initial period in which air readings were analyzed, a decision was made to send mine rescue teams into the mine to the suspected location of the miners. A natural flow of intake air was entering Nos. 1 and 2 entries and exiting Nos. 3 and 4 entries. A quantity of approximately 70,000 cfm remained relatively constant throughout the rescue and recovery operations. For this reason, the main fan was never restarted during the rescue and recovery. Since natural ventilation is driven by temperature differences and the differences in the surface and underground elevations, the temperature and weather forecast were continuously monitored.

Between 10:30 a.m. and 3:20 p.m. various mine rescue teams systematically explored up to No. 20 crosscut. During this exploration, the highest concentration of methane detected was 1.6 percent and the highest concentration of carbon monoxide was 2,000 ppm. The intake air quantity measured in the No. 16 Crosscut was 77,161 cfm.

At this time, ventilating air continued to intake in Nos. 1 and 2 entries and returned through the Nos. 3, 4, 5, and 6 entries, even though there were not any ventilation controls in by the No. 6 crosscut. Rescue teams continued to explore and install temporary ventilation controls to the No. 70 crosscut.

By 2:05 a.m. on December 8, 1992, the Clinchfield Team had advanced to the No. 81 crosscut. This was the entrance to the 1 Left section, approximately 300 feet from where the miners were expected to be located. After the team turned the corner into 1 Left, they reported 6.4 percent methane, in excess of 10,000 ppm carbon monoxide and rolling smoke and heat coming from the

