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UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

COAL PREPARATION FACILITY

Fatal Powered Haulage Accident
June 10, 2004

at

Tug Valley Coal Processing Company
Tug Valley Coal Processing Company
Naugatuck, Mingo County, West Virginia
ID No.46-05890

Accident Investigator

Sherman L. Slaughter
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OVERVIEW

At 12:30 p.m. on Thursday, June 10, 2004, a 52-year old heavy equipment operator with 26 years of mining experience was fatally injured at Tug Valley Coal Processing Company's Tug Valley Coal Processing Company plant. The accident occurred while the victim was operating a refuse truck while descending a grade from the crest of an impounding structure. The driver lost control of the truck during the descent, causing the truck to leave the roadway, travel across a ditch, and overturn. The driver was found along the ditch, approximately 60 feet uphill from the truck.

A failure occurred in the right front drive axle brake chamber of the truck as it descended the steep grade. The nature of this failure caused the truck to lose both primary and secondary brake system air pressure, ultimately resulting in a total loss of service brake capability. The truck was equipped with spring applied brakes designed to apply in an emergency situation. Two of the four spring applied brakes, however, were defective. These defects resulted in the loss of control of the truck while descending the steep grade. With fully functional and maintained spring brakes, the victim would have been able to achieve a controlled descent.

The latching mechanism of the seat belt in the truck was defective due to a broken internal plastic component. The victim was not wearing the seat belt when the accident occurred. He received fatal injuries from contact with the truck after he either jumped or

was thrown from the truck. It is probable that the degree of injury would have been lessened by correctly wearing a fully functional seatbelt..

GENERAL INFORMATION

Tug Valley Coal Processing Company, I.D. 46-05890, is located near Naugatuck, Mingo County, West Virginia, and is operated by the Tug Valley Coal Processing Company. The mine includes a 1,750 raw ton per hour preparation plant, a 4,000 ton per hour unit train load out facility, and two refuse impoundments identified as the Spruce Creek Impoundment and the Aldrich Branch Refuse Impoundment.

Tug Valley Coal Processing Company began operation of the preparation plant in 1976. The plant processed coal for the Marrowbone mining complex that includes numerous underground and surface mines. Raw coal was transported to the plant by conveyor belts and trucks. Processed coal was transported from the plant by trucks and trains.

Although constructed, the Spruce Creek Impoundment has never been used to hold coal refuse slurry. The dam of the impoundment was breached in 1996 and the impoundment was partially reclaimed. Slurry and refuse from the plant have been deposited at the Aldrich Branch Impoundment.

In August, 2003, the preparation plant and the Aldrich Branch Impoundment were idled. Only maintenance and environmental work required to maintain the impoundment have been performed from that time until the date of the accident.

Esmer and Associates, a contract engineering firm from Boomer, West Virginia, performs the required examinations for the impoundment every Tuesday and Thursday. If the examinations revealed that environmental work was required, the work would be performed by miners from the nearby Triad Mining, No. 1 Surface mine, I. D. 46-06089. Two security guards employed by a contractor, Mountaineer Investigation and Security, worked at the security building at the plant. They monitored the property at the surface mine and the plant. They were emergency medical technicians (EMTs), and provided emergency assistance to persons at the mines.

The operator assigned four employees to perform the environmental work at the impoundment and preparation plant on an as needed basis. The majority of the time they worked at the nearby Triad Mining Company, No. 1 Surface Mine. The typical work schedule consisted of four days per week, one shift per day from 7:00 a.m. until 5:00 p.m.

The principal officers for the mine at the time of the accident were:

Robert L. Baldwin	President/General Manager
Roger Runyon	Safety Manager
Billy Runyon	Supervisor

Prior to the accident, the Mine Safety and Health Administration (MSHA) last completed a regular safety and health inspection on April 6, 2004. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine in 2003 was 21.05 compared to a National NFDL rate for coal preparation plants of 3.00.

DESCRIPTION OF ACCIDENT

At 7:00 a.m. on June 10, 2004, employees Glen R. Brewer and Gary L. Walker, heavy equipment operators, started work at the shop located below the Aldrich Branch Refuse Impoundment. Brewer conducted a pre-operation inspection on a model RD888SX Mack tandem coal haulage truck which was parked at the shop. He did not report any safety defects on the truck. Brewer and Walker had been given instructions by Billy Runyon, supervisor, to perform environmental work at the impoundment during the shift. They were to repair a sump located at the toe of the impoundment. This would require removal of material that had washed into the sump and reconstruction of the dam of the sump with clay dirt. Walker was going to haul the sump cleanings and dirt with the Mack truck, while Brewer was going to operate a Gradall extendable boom excavator (Gradall) to load the material.

Brewer and Walker took the truck near the preparation plant where they loaded water into the bed. Brewer drove the truck while giving Walker instructions on how to operate the engine brake and controls. They used the truck to spread water on the haul road for the Eastern stockpile area of the adjacent Triad Mining Company, No. 1 Surface Mine. Trucks were scheduled to haul coal from the stockpile during the shift. When they arrived at the stockpile, they talked to Robert M. Rice II, heavy equipment operator and victim, who was operating an end loader.

They traveled back to the shop at the toe of the impoundment, where Brewer conducted a pre-operational examination on the Gradall. He fueled the machine and prepared to work on the sump at the toe of the impoundment. During this time, Walker used the Mack truck to haul three additional loads of water for the roadways at the No. 1 Surface Mine.

At 8:00 a.m. Runyon was told that the operator would not haul coal from the Eastern stockpile area during the shift. Runyon instructed Rice to go to the impoundment and work with Brewer and Walker for the remainder of the shift. Rice drove his personal vehicle to the shop at the impoundment.

After Walker completed hauling the last load of water he took the truck back to the sump area where Brewer was waiting with the Gradall to load material into the truck. The truck was loaded when Rice arrived. Brewer told Rice to wait at the shop while he and Walker took the loaded truck up onto the top of the impoundment and dumped the load.

Brewer drove the loaded truck to the top of the impoundment and dumped the load, while Walker rode along with him. While dumping the load, they noticed that one of the tail gate latches was broken. Realizing that they would not be able to haul the wet material from the sump with the broken gate latch, Brewer decided to take the truck to the Sartin Trucking shop for repair. The Sartin Trucking shop is located below the preparation plant. Brewer drove the truck off of the impoundment and let Walker get out of the truck at a dozer which was parked about halfway down the impoundment access roadway. Brewer told Walker to use the dozer to clean a place off of the face of the impoundment in order to dump the wet material.

Larry R. Hall, field technician for Esmer & Associates, arrived at the impoundment at 8:30 a. m. to conduct a weekly impoundment examination. He contacted Walker and began his examination.

Runyon had contacted Remona Marcum, security supervisor, by telephone with instructions to give Brewer. Marcum then instructed Gary Damron, security guard and Emergency Medical Technician to bring Brewer to the security building. Damron went to the impoundment to contact Brewer. Damron returned to the security building with Brewer at about 9:30 a.m. Brewer received instructions from Marcum to work on the impoundment utilizing Rice to operate the truck and Walker to operate the dozer. Runyon and Brewer had driven over the impoundment the previous day, and Brewer knew what work needed to be completed. After Marcum gave Brewer the information, Damron took Brewer back to the impoundment.

Brewer met Rice at the shop located below the impoundment and both of them took the truck to Sartin Trucking's shop. While Brewer drove the truck, he told Rice that the engine brake on the truck was in good shape. Rice told Brewer that he had driven this truck before and knew how to operate it.

When Brewer got to the shop he contacted Riley Sartin, owner of the truck, by telephone. Sartin told Brewer that they did not have another truck for him, and that if he would use the truck, they would repair the gate latch during the weekend. Brewer drove the truck as he and Rice returned to the impoundment.

At approximately 11:15 a.m., Brewer and Rice ate lunch at the shop. After lunch, Brewer loaded three buckets of sandy material into the truck at the sump below the impoundment. Rice drove the loaded truck to the top of the impoundment to dump the load. Brewer followed the truck in the Gradall. En route they spoke to one another on the CB radio. Brewer told Rice about the switchbacks in the road, and Rice responded that he was doing fine. Rice dumped the load of material on top of the impoundment.

Brewer loaded about ten buckets of clay dirt from the back side of the impoundment into the truck. As Rice left with the load, Brewer told him over the radio to make sure he used the correct gear going off of the impoundment. Rice responded that he would, and proceeded to take the dirt to the sump located at the toe of the impoundment.

At about 12:15 p.m., Hall had a discussion with Walker concerning work that needed to be done on the impoundment. Walker was operating the dozer on the back side of the impoundment. Hall then drove his pickup truck to the top of the dam on the impoundment near Piezometer No. 16 where he parked and ate lunch. While eating lunch he observed Rice and Brewer bring the truck and the Gradall up onto the impoundment. He continued to watch as Brewer loaded the truck and the truck started off the impoundment along the access road. He heard Brewer tell Rice over the CB radio to make sure he was in the right gear when he started down the hill. He lost sight of the truck as it traveled down the roadway into the first curve. He could not see the truck after it entered the curve. Through his open truck window he heard a loud noise and saw dust fly up. He radioed Brewer and told him he believed that Rice had wrecked the truck.

Hall immediately drove towards where he had seen the dust come up off the roadway. Brewer followed Hall in the Gradall. Upon arrival at the truck, he could see that it had crossed the ditch on the left side of the roadway (looking down grade) and turned up onto its right side. Most of the dirt had spilled out of the truck onto the roadway. He saw the victim sitting up on the bank behind the left side of the truck. Brewer immediately arrived, and both he and Hall jumped across the ditch to aid the victim. Brewer and Hall got to the victim immediately after the accident occurred. When they arrived, the truck was not running. When Hall attempted to talk to the victim, he did not respond. First aid was immediately administered. Brewer continued to attend to the victim, while Hall traveled in his truck to the preparation plant to contact Damron. Hall explained to Damron what had occurred and got a key to access the warehouse. He went to the warehouse and called 911 at approximately 12:50 p.m.

Damron immediately drove to the accident site. He contacted Marcum while en route at about 12:35 p.m. Marcum notified mine management of the accident. When Damron, who was an EMT, got to the victim, Brewer was attempting to control the bleeding. Damron immediately aided Brewer in the care of the victim, including monitoring the vital signs and administering oxygen.

At about 12:45 p.m., Marcum arrived and radioed to have Healthnet dispatched. At this time, the victim's respirations were labored and the pulse was weak. An ambulance from Kermit, West Virginia, arrived shortly after 1:10 p.m. The victim was pronounced dead by a coroner and transported from the mine at about 3:00 p.m. to Belfry, Kentucky. He was later moved to the medical examiner's office at Charleston, West Virginia.

INVESTIGATION OF THE ACCIDENT

The MSHA Logan Field Office was notified of the accident at 2:10 p.m. on Thursday, June 10, 2004. MSHA accident investigators were immediately dispatched to the mine. A 103 (k) order was issued to insure the safety of all persons at the mine. The investigation was conducted in cooperation with the West Virginia Office of Miners' Health, Safety, and Training, with the assistance of the mine operator and employees (refer to Appendix A for a list of persons who participated in the investigation).

The investigation team traveled to the accident scene to conduct an investigation of existing physical conditions. Photographs and relevant measurements were taken. Initial interviews were conducted at the accident site. Formal interviews were later conducted at the operator's office with eight persons who had knowledge relevant to the accident. The physical portion of the investigation was completed on June 22, 2004. The 103 (k) order was terminated on October 7, 2004, after the operator instituted brake testing, examination, and maintenance procedures to prevent a recurrence.

DISCUSSION

Mack RD888SX Haulage Truck

The truck involved in the accident was a 1994 Mack RD888SX Tandem Drive Axle Truck, VIN 1M2P282C3RM001823, equipped with a dump body type bed, a diesel engine with a Jacobs type engine retarder (engine brake), an 8-speed transmission, and 6.73 drive axle ratio. The truck was being leased from Lee Sartin Trucking by Tug Valley Coal Processing Company and was referred to by Lee Sartin Trucking as truck #23. Tug Valley Coal Processing Company was responsible for all maintenance of the truck.

The net vehicle weight, or 'light weight', of the truck was approximately 46,620 pounds. The dump body, model S1870, serial number 94-709, was manufactured by Benson Truck Bodies. The diesel engine was a 1994 Mack model E7-400, serial number 4G1685, rated for 400 HP at 1,800 RPM. The 8-speed Eaton-Fuller transmission was a model RTX 14708LL, serial number 70477366.

Truck Brake System

The truck was equipped with a Jacobs engine brake that had three selectable modes which could be selected using a toggle switch on the dash panel. The three toggle positions were off, low, and high. It was determined that the engine brake and controls were fully functional at the time of the accident.

The truck had a dual-circuit air brake system (one circuit for the steering axle service brakes and one circuit for the rear axle service brakes) with s-cam type drum brakes at all six wheels. It had air-applied service brakes at all six wheels and spring-applied, air-released parking brakes on the 4 tandem drive axle wheel positions, or rear drive wheels.

The brakes on the steering axle (front brakes) were 16 ½" X 5" (brake drum diameter x shoe lining width) with a Type 24 rotochamber on the left side brake and a Type 16 rotochamber on the right side brake.

The brakes on the tandem drive axles (rear brakes) were 18" X 7" (brake drum diameter x shoe lining width) with Type 30-30 combination brake chambers.

The actual service brake chamber pushrod strokes (brake adjustment) did not exceed the maximum stroke recommended for the brake chambers installed on this truck.

The right steering axle brake contained grease which contaminated the linings. Approximately 2 inches of the 5 inch wide lining surfaces were contaminated with grease on the outboard side of both shoes. This grease would inhibit the contact between the brake lining and the brake drum.

The right front tandem drive axle brake had a broken spider (mounting bracket for the shoes and s-cam shaft) in the anchor pin area for the shoes. The lining on the trailing edge of the leading shoe had worn into the metal of the shoe core. Approximately 1/8 inch of metal had been worn from the shoe core in this area on the outboard side of the shoe. The brake lining on the leading edge of the trailing shoe had a portion missing.

The left front tandem drive axle brake had portions of the shoe linings missing. A portion was missing on the trailing edge of the leading shoe and a portion was missing on the leading edge of the trailing shoe. The spider on this brake had two visible cracks initiating in the anchor pin area with the more predominant of the two being approximately 2 ¼ inches in length. However, the cracks did not appear to affect the function of the brake.

Brake lining thicknesses and some of the significant findings for the brake shoes are summarized in Table #4. A lining thickness above ¼ inch is typically acceptable.

	Left Side Lining Thicknesses (inches)	Right Side Lining Thicknesses (inches)
Steering Axle	⅝	½ (grease contamination on lining surfaces)
Front Drive Axle	½ (portions of lining sections missing)	½ (abnormal lining wear and portions of lining sections missing)
Rear Drive Axle	½	⅝

Table #4: Approximate Brake Lining Thicknesses

All but two brake drums were measured to be worn beyond the wear limits recommended by the drum manufacturer. The maximum recommended drum diameter for the nominal 16 ½"drum is 16.620" and the maximum recommended drum diameter for the nominal 18" drum is 18.120". The measured drum diameters are summarized in Table #5.

	Left Side Drum Diameters (inches)	Right Side Drum Diameters (inches)
Steering Axle	16.540	16.620
Front Drive Axle	18.159	18.188
Rear Drive Axle	18.145	18.154

Table #5: Measured Drum Diameters

Accident Scene

After starting to travel down the Aldrich Impoundment access roadway from the top of the impoundment the loaded truck traveled approximately 480 feet down an average 11% grade through the first curve. After exiting the curve the truck traveled an additional 630 feet over an average 9.3 % grade until the tire tracks of the truck indicated the driver began to steer the truck straight toward the left side roadway ditch (looking down grade). The grade of the road was 7.8 % at this location. The truck traveled down the roadway another 130 feet over a 9.4 % grade where the tire tracks started going in the direction of the ditch until the truck crossed the ditch. The truck crossed the ditch, traveled 125 feet, and overturned onto it's right side.

The ditch was approximately 18 inches deep where the left drive axle wheels crossed; but immediately got deeper, up to approximately 38 inches, where the truck overturned. The truck was out of everyone's view when the truck entered the ditch and overturned.

The victim was found sitting on the ground approximately 60 feet behind the truck, and 5 feet to the left (looking downgrade) of where the left drive axle wheels had traveled. A mark in the bank was present eight feet from the victim's location in the direction the truck traveled. Additionally, this mark was 27 feet from the location where the left drive axle wheels crossed the ditch. This mark indicates the location where the truck bed hit the ground. Evidence indicates that the victim was struck by the left rear outside drive wheel, and the left bottom corner of the rear of the truck bed above the tailgate latch.

The park brakes of the truck were applied before Brewer and Hall arrived at the accident site.

The cab of the truck was "sprung" out of alignment with the doors. The right door could not be shut and the left door hinges were bent making it hard to shut the door. Witnesses that had driven the truck before the accident stated that nothing was wrong with the doors prior to the accident. The bell housing connecting the engine to the transmission was extensively cracked. This damage occurred during the accident, and indicated that the truck hit the ditch with severe force. No visual or functional defects were identified that would have prohibited power transfer through the transmission to the wheels.

The seat belt provided in the truck was defective. When tested, the release lever for the latch hung in the released position when moved to release the latch (unhook the belt). This malfunction was caused by a broken internal plastic component of the latch. To hook the belt after releasing it, the lever had to be pulled up before the two halves of the belt would latch. The defect existed prior to the accident.

The victim was not wearing the seat belt at the time of the accident. The previous operator who conducted the pre-operational inspection knew the belt was defective. He had experienced a problem with the belt when he drove the truck earlier in the shift on the day of the accident. He did not make the victim aware of the defect before the victim began driving the truck. The operator's policy required that the truck drivers use

seatbelts. It is reasonable to determine that the victim experienced difficulty latching the belt, and was not aware that the belt would latch even though he may have pulled the release lever up into the latch position.

The release lever was in the raised position after the accident occurred indicating that the victim had not been wearing the belt immediately prior to the accident. If the victim had been wearing the belt and had released the latch to exit the truck immediately before the accident, the latch would have been stuck in the release position. Other than the latch, the seat belt was in good condition and properly secured to the cab.

Bob Peters, Maintenance Foreman, heard the low air warning alarm (buzzer) sound when he arrived at the accident site. This indicated to him that the engine switch was on. He was concerned that the energized electrical wires could ignite the fuel leaking from the truck, and requested that the switch be turned off. The investigators at the site agreed to allow Steve Meddings, representative of miners, to climb into the cab and turn the engine switch off.

The deep reduction selector (blue) located on the side of the gear selector was not in the deep reduction position, and would not allow the transmission gears to go into this position if the gear range selector was in the high side.

The Jacobs engine brake switch was in the high position.

The hand control valve located on the right side of the steering column was partially applied (down about half way).

The air system gage showed 0 PSI of pressure. Both the red (secondary) and the green (primary) gage needles were on 0.

The parking control valve (yellow) was in the applied position.

Equipment Testing

The right front tandem drive axle brake chamber had an audible leak with the foot pedal and parking brake released. The leak rate was 60 times the maximum acceptable level of leakage as specified by the manufacturer (Mack). The chamber would also leak if the foot pedal (treadle valve) was applied when the parking brake was engaged, due to the anti-compounding feature within the parking brake system.

The parking brake valve was set to automatically apply the parking brakes when the supply air pressure to the parking brake control valve dropped to a range of 30-40 PSI.

During the recovery of the truck, the truck was towed (empty) by a dozer with the parking brakes applied. The left front drive axle and the right rear drive axle tires were observed to skid on the haul road while the right front drive axle and left rear drive axle tires rolled on the haul road.

The right side steering axle brake chamber could not be tested due to damage incurred by the accident.

The truck was equipped with low air pressure switches for both the primary (rear brakes) and the secondary (front brakes) air systems. The secondary low air pressure switch was found disconnected from the warning circuit. The primary low air pressure circuit was tested. An audible warning occurred when the primary air pressure fell to 63 PSI as indicated by the green needle on the dash gage.

When the failure occurred in the right front drive axle park brake chamber, and the system air pressure began to decrease, the truck began to rapidly lose the service brakes. The victim may have applied the park brakes of the truck as he traveled down the roadway. If he didn't, the park brakes automatically engaged within approximately 44 seconds after the failure occurred. They engaged when the brake system pressure dropped to approximately 40 psi.

The truck's air leak rate was measured under following conditions: (A) the right side steering axle brake chamber was removed from the air brake system, (B) the parking brake portion of the right front drive axle brake chamber was removed from the air brake system, (C) the parking brake was engaged, and (D) the service brakes were released. The average static air leak rate was less than 3 PSI per 2 minutes. This was less than the maximum allowable leak rate of 4 PSI per 2 minutes.

The transmission of the truck was in 5th gear when the accident occurred. The evidence indicated that from the location where the truck began losing brake air pressure, to the point where the truck crossed the ditch, it had traveled approximately 714 feet. This indicates that the failure occurred in the right front drive axle brake chamber as the truck traveled out of the first curve from the top of the impoundment.

The magnitude of the air leak in the parking brake portion of the brake chamber for the right front tandem drive axle, would result in a relatively rapid reduction in the capacity of the service brakes, even though four of the six service brakes were capable of providing some degree of braking. This reduction in braking capability would start as soon as the parking brakes were released, and would deplete all of the reserve air until the spring brakes automatically applied. This would occur even without the service brakes applied,. The only operational mode in which this air leak would not occur is when the parking brakes are applied and the service brakes are released.

The parking brake system allowed two of the four sets of rear dual tires to roll while the truck was being towed and unloaded, further indicating the braking capacity of the parking brake system was compromised, possibly up to 50 percent.

The combined effect of the defects, including the air leak, resulted in less than one good brake controlling the truck at the time of the accident.

Equipment Operation

Testimony indicates that previous operators would have traveled down the grade with the truck in 2nd gear loaded and 3rd or 4th gear empty. All of the drivers agreed that they would not change gears once they started down the grade loaded. Interviews of the previous drivers indicates that the normal procedure during a truck problem was to stay in the truck, wear the seatbelt, steer the truck to the ditch side of the roadway to get it stopped, and stay inside the truck where the opportunity of steering the truck into the ditch may present itself.

Both Brewer and Walker agreed that if the truck was in 2nd gear while hauling a load from the top of the impoundment, and the driver inadvertently took the transmission out of gear, it would be necessary to reach a very slow speed using the brakes to re-engage 2nd gear. If the driver could not slow the truck, he would have to shift to a higher gear to get the transmission back into a gear.

When the victim lost the brakes on the truck, the load would have began "pushing" the truck against the retarding action of the engine brake. With the truck engine at 1,800 RPMs (normal engine speed using the engine brake) when the failure occurred, a short period of time would have elapsed before the RPMs began to increase. Operating the engine above the maximum RPM limit of about 2,150 RPM would damage the engine to the extent that the engine brake would not function. The only action that would keep the engine brake working would be the shifting of the transmission to a higher gear. Because the victim was descending the steeper portion of the upper part of the roadway when he lost braking capacity, it is reasonable to conclude that the truck engine speed would have increased enough to cause him to shift to a higher gear. This explains why the truck was in 5th gear when the accident occurred.

Preoperational Examination

Brewer conducted the pre-operational examination on the truck at the beginning of the shift on June 10, 2004. He did not check the brake lights. He checked the tires, oil, fire extinguisher, seat belt, low air warning light and buzzer, and air pressure. He started the truck rolling with full air and applied the foot brakes checking them by "feel". He determined the foot brakes were functioning properly. He did not check the park brakes on the day of the accident. He used the seat belt during the early part of the shift while driving the truck. He knew about the defective seat belt latch, however he failed to report the defect on the preoperational examination record.

Brewer brought the truck from the Sartin Trucking Shop to the plant on June 7, 2004. He used the truck the first three days to haul water for the roads at the Triad Mining, No. 1 Surface Mine. When he did the pre-operational examination on the truck on June 7, 2004, he checked the park brakes by setting the park brake and trying to pull against the brake in 3rd gear. He determined the park brake was functional because the truck engine began to stall. He did a pre-operational examination on the truck each day he operated it. He did not complete a report of the examination for June 7 and 8, 2004. He did not check the

park brakes after June 7, 2004. No one else used the truck except for the victim and Walker. They did not do a pre-operational examination on the truck because Brewer had previously completed one.

A complete and thorough examination of the brake system, including a visual examination of the internal brake components, had not been performed on the truck since it was leased on June 7, 2004. In addition, the operator who owned the truck did not have any records showing when these components were last examined. No one at the mine knew the condition of the truck's brake components.

The active work area where the accident occurred had not been examined for hazardous conditions by a certified person on the day shift of June 10, 2004. Kenny Morgan was the person designated to conduct the workplace examinations at the impoundment. He was not at the site on the day of the accident.

Except for examinations, work had not been conducted at the impoundment for the previous eight months until the day of the accident.

Experience and Training

The victim had worked at this mine for 20 years. He had driven the Mack tandem coal trucks at this mine for at least 10 years. He had hauled loads up the steep road onto the impoundment numerous times but had seldom hauled loads down the road. He operated a dozer for many years, but had driven a coal truck the majority of the time for the previous two years. He had driven the same type of Mack truck hauling coal off steep grades at the adjacent Triad Mining, No. 1 Surface Mine. He knew how to operate the loaded truck on steep grades. He had worked at the Eastern raw coal stockpile area of the Triad surface mine for the last eight months. In addition, he operated an end loader loading coal trucks and working the stockpile. The victim was an experienced operator and training was not found to be a cause of the accident.

Brewer discussed operation of the truck with the victim the day of the accident because the victim had not driven the truck recently. Brewer was the most knowledgeable of the truck's current condition because he had examined the truck and had been driving the truck for three days. The victim told Brewer that he had previously driven the truck.

Previous instruction had been given to the truck drivers to wear seat belts, don't jump out of a run away truck, drive the truck to the ditch if it gets out of control, check brakes on level ground, ensure the truck is in the correct gear before going down a grade, and not to shift gears on a hill. The operator did not have a documented safety program that included these instructions. There were no signs posted on this roadway which would have related these instructions, or would have given equipment operators any information relative to the existing road hazards.

ROOT CAUSE ANALYSIS

An analysis was conducted to identify the most basic causes of the accident that were correctable through reasonable management controls. During the analysis, causal factors were identified that, if eliminated, would have either prevented the accident or mitigated its consequences.

Listed below are causal factors identified during the analysis and their corresponding corrective actions implemented to prevent a recurrence of the accident:

1. *Causal Factor:* The parking (spring applied) brake system of the 1994 Mack RD888SX truck, VIN 1M2P282C3RM001823, was defective. The operator could not determine when the components of the brake system had been examined for defects. A program was not in place to perform a physical examination of the brake systems and components of trucks leased for use at the mine.

   Corrective Action: The operator developed a program of examination that required operator owned and leased trucks to be inspected by persons with maintenance experience. This is to be conducted when the trucks are first brought to the mine prior to being placed into operation and at six months intervals thereafter. The inspection includes a physical examination of the braking system by removing the wheel unit dust covers and the wheel units if necessary to determine the condition of the components. A record of the examination, and any needed repairs, will be completed and maintained at the mine.

2. *Causal Factor:* The driver of the 1994 Mack RD888SX truck, VIN 1M2P282C3RM001823, was not instructed to function test the truck braking system to ensure the brakes were capable of stopping and holding the loaded truck on a grade. In addition, a safe procedure for testing the brakes of the loaded truck was not established.

   Corrective Action: The operator designated an area of the road at the top of the impoundment as a brake test area and constructed a ramp at the test area to be used by a truck having difficulty with the brakes while being tested. The grade of the road at the test area is ten percent. Signs have been posted identifying the test area. The workers were instructed to test the brakes of the trucks before hauling loads off the impoundment and were instructed in the procedures required to conduct the test.

3. *Causal Factor:* The victim was not wearing the seat belt when the accident occurred. The seatbelt had a defect in the latching mechanism due to a broken internal plastic component. The person who conducted the pre-operational inspection did not report the defect and the defect was not corrected before the truck was used. The victim was not aware of the defect before driving the truck. The defective condition of the seatbelt could reasonably have resulted in the victim not wearing the belt, and may have contributed to the cause of the accident.

Corrective Action: The operator instructed all employees on the importance of wearing seatbelts. The safety program of instruction requires that equipment operators use seatbelts at all times; that seatbelts be examined during pre-operational checks; and that if a seatbelt is discovered to have a defect, the equipment is to be taken out of service. All seatbelts on operator-owned and leased equipment were examined to determine that they were in proper working condition.

CONCLUSION

A failure occurred in the right front drive axle brake chamber of the truck as it descended the steep grade. The nature of this failure caused the truck to lose both primary and secondary brake system air pressure, ultimately resulting in a total loss of service brake capability. The truck was equipped with spring applied brakes designed to apply in an emergency situation. Two of the four spring applied brakes, however, were defective. These defects resulted in the loss of control of the truck while descending the steep grade. With fully functional and maintained spring brakes, the victim would have been able to achieve a controlled descent.

Prior to the accident, the brakes of the truck were not tested to determine if they were sufficient to stop and hold the loaded truck on the grade where it was being used. Procedures were not in place to test the brake system. A physical examination of the brake systems and components of the truck had not been made since the truck was leased for use at this site.

The latching mechanism of the seat belt in the truck was defective due to a broken internal plastic component. The victim was not wearing the seat belt when the accident occurred. He received fatal injuries from contact with the truck after he either jumped or was thrown from the truck. It is probable that the degree of injury would have been lessened by correctly wearing a fully functional seatbelt.

Approved By:

ORIGINAL SIGNED
Jesse P. Cole
District Manager

APRIL 25, 2005
Date

ENFORCEMENT ACTIONS

1. A 103(k) Order, Number 4861642, was issued to Tug Valley Coal Processing Company on June 10, 2004, to ensure the safety of persons at the mine until all areas and equipment were deemed safe.

2. A 104(a) citation, Number 7214018, was issued to Tug Valley Coal Processing Company, for a violation of 30 CFR 77.404(a) stating in part that the 1994 Mack RD888SX tandem truck, VIN 1M2P282C3RM001823, was not maintained in safe operating condition.

3. A 104(a) citation, Number 7214019, was issued to Tug Valley Coal Processing Company, for a violation of 30 CFR 77.1606(c) stating in part that the seatbelt provided for the 1994 Mack RD888SX tandem truck, VIN 1M2P282C3RM001823, was defective. The defect affected safety and was not corrected before the truck was used.

Appendix A
Persons Participating in the Investigation

Tug Valley Coal Processing Company

Name	Title
Robert L. Baldwin	President/General Manager
Roger Runyon	Safety Manager
Billy Runyon	Supervisor
Mark E. Heath	Attorney
Bob Peters	Maintenance Foreman
Terry E. Whitt	VP of Human Resources
Curt Weittenhiller	General Manager Idle Properties

Esmer & Associates

Name	Title
Larry R. Hall	Technician

Mountaineer Investigation & Security

Name	Title
Remona Marcum	Security Guard
Gary Damron	Security Guard

Cook Tire Inc.

Johnny Bush	Tire Technician

J&A Consulting, Inc.

Eddie Curry	Survey Engineer

Tug Valley Surveying, Inc.

Alan J. Coffey	Survey Engineer

United Mine Workers of America (UMWA)

Name	Title
Glen R. Brewer	Heavy Equipment Operator
Scott Erwin	Safety Committee
Cletus Sartin, Jr	Safety Committee
Steve Meddings	Mechanic
Rick Glover	UMWA International Representative
Gary Workman	UMWA Recording Secretary
Jeff Pannell	Heavy Equipment Operator
Gary Walker	Heavy Equipment Operator

Lee Sartin Trucking

Name	Title
David Fields…….	Mechanic
Riley Sartin……..	Owner

Eric's Trucking

Name	Title
Eric Sartin……..	Owner

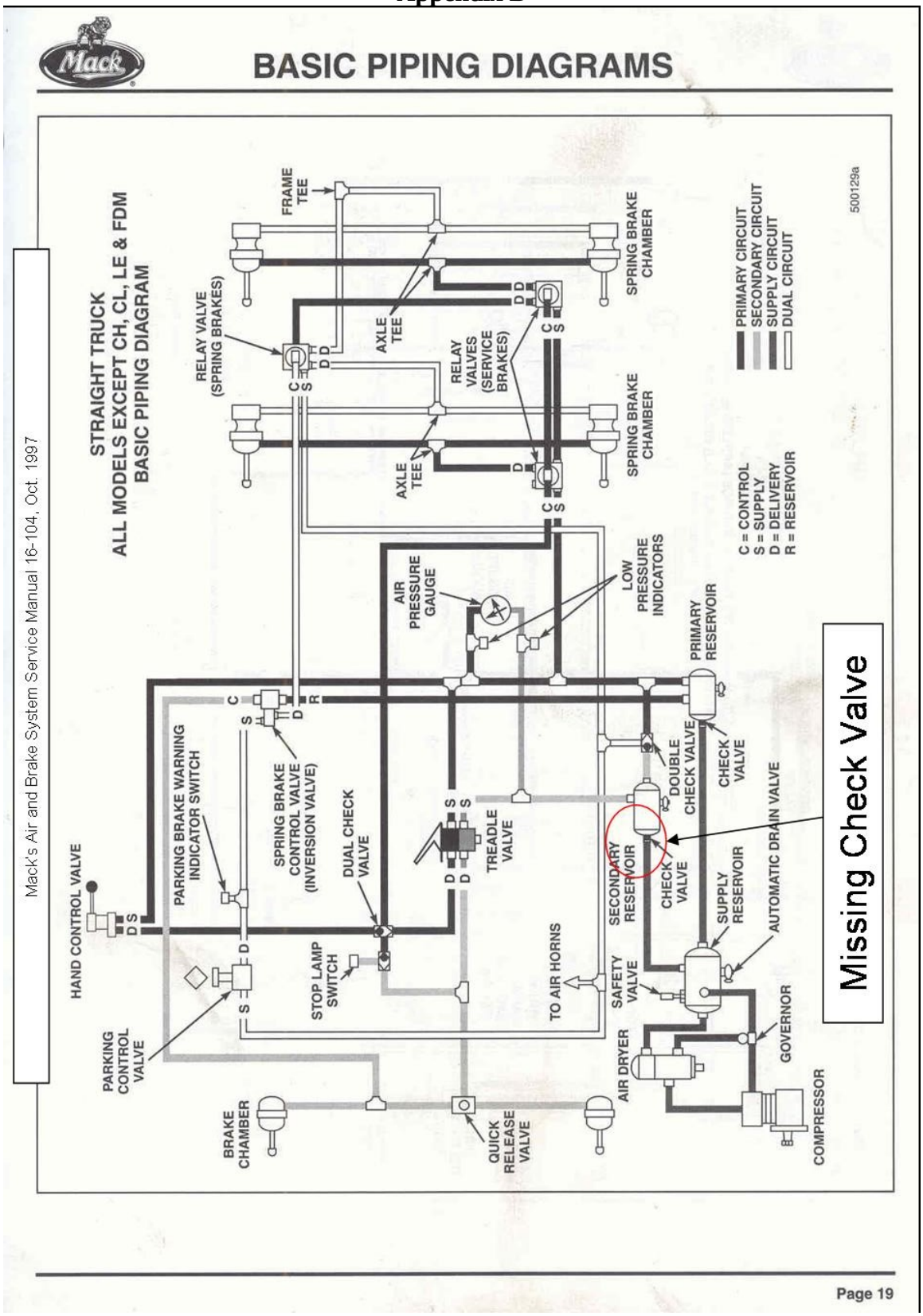
West Virginia Office of Miners' Health, Safety, and Training

Name	Title
Terry Farley	Accident Investigator
Richard Boggess	Inspector
Randall Bailey	Surface Inspector
Dennis Ballard	Assistant Inspector At Large

Mine Safety and Health Administration

Name	Title
Sherman L. Slaughter	Accident Investigator
F. Terry Marshall	Mechanical Engineer
Stephen J. Gigliotti	Acting District Manager
Chris A. Weaver	Acting Assistant District Manager
Bill Gillenwater	Supervisory CMS&H Inspector
Vicki Mullins	Coal Mine Safety and Health Inspector

Appendix B


BASIC PIPING DIAGRAMS
STRAIGHT TRUCK
ALL MODELS EXCEPT CH, CL, LE & FDM
BASIC PIPING DIAGRAM
Mack's Air and Brake System Service Manual 16-104, Oct. 1997
500129a
PRIMARY CIRCUIT
SECONDARY CIRCUIT
SUPPLY CIRCUIT
DUAL CIRCUIT
C = CONTROL
S = SUPPLY
D = DELIVERY
R = RESERVOIR
FRAME TEE
SPRING BRAKE CHAMBER
RELAY VALVE (SPRING BRAKES)
AXLE TEE
RELAY VALVES (SERVICE BRAKES)
AIR PRESSURE GAUGE
LOW PRESSURE INDICATORS
PRIMARY RESERVOIR
HAND CONTROL VALVE
PARKING BRAKE WARNING INDICATOR SWITCH
SPRING BRAKE CONTROL VALVE (INVERSION VALVE)
DUAL CHECK VALVE
TREADLE VALVE
DOUBLE CHECK VALVE
CHECK VALVE
SECONDARY RESERVOIR
SUPPLY RESERVOIR
AUTOMATIC DRAIN VALVE
STOP LAMP SWITCH
TO AIR HORNS
SAFETY VALVE
PARKING CONTROL VALVE
AIR DRYER
GOVERNOR
BRAKE CHAMBER
QUICK RELEASE VALVE
COMPRESSOR
Missing Check Valve
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