

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Underground Bituminous Coal Mine

Fatal Powered Haulage Accident
June 16, 2004

at

No. 7 Mine
Jim Walter Resources, Inc.
Brookwood, Tuscaloosa County, Alabama
I.D. No. 01-01401

Accident Investigators

Charles E. Carpenter
Coal Mine Safety and Health Inspector

David H. Allen, Jr.
Mining Engineer

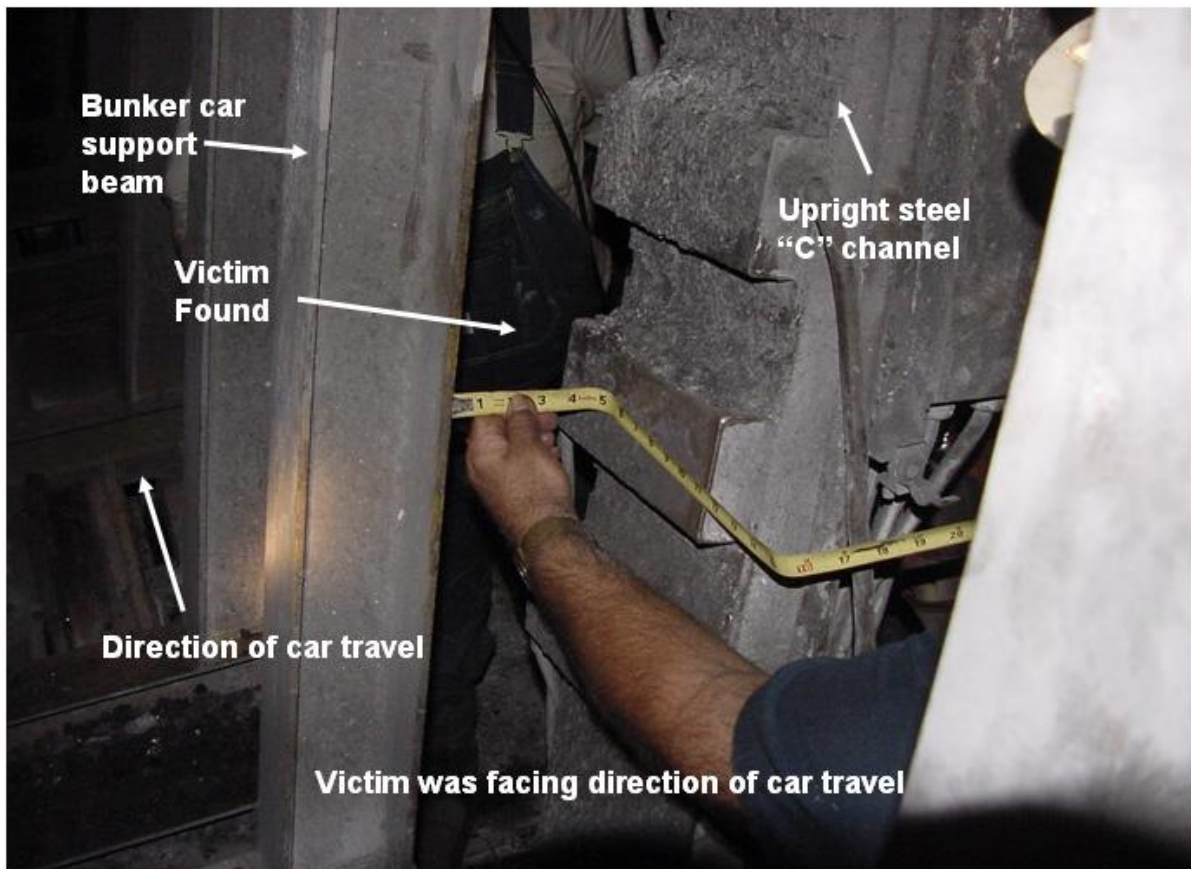
John R. Smoot
Coal Mine Safety and Health Inspector

Gary Clark
Mechanical Engineer, Technical Support

Originating Office
Mine Safety and Health Administration
District 11
135 Gemini Circle, Suite 213, Birmingham, Alabama 35209
Richard A. Gates, District Manager

TABLE OF CONTENTS

OVERVIEW	1
GENERAL INFORMATION	2
DESCRIPTION OF ACCIDENT	3
INVESTIGATION OF THE ACCIDENT	5
DISCUSSION	6
Bunker System Information	6
Accident Scene Information	6
Training	7
Accident Scenario	8
ROOT CAUSE ANALYSIS	8
CONCLUSION	9
ENFORCEMENT ACTIONS	10
APPENDIX A - Persons Participating in the Investigation	12
APPENDIX B - List of Persons Interviewed	14
APPENDIX C - Photograph	15
APPENDIX D - Diagram	16



OVERVIEW

At approximately 9:40 a.m. on Wednesday, June 16, 2004, a 45-year old general inside laborer with over 23 years mining experience at the Jim Walter Resources, Inc., No. 7 Mine, was fatally injured in a powered haulage accident at the underground raw coal storage bunker area. The accident occurred while the victim was washing loose raw coal material away from the discharge end of the bunker system seal belt into the production shaft pocket, which was part of his normal job duties. The victim became entrapped between a vertical support beam on the frame of the moving number 15 bunker car and a stationary upright steel "C" channel. There were no eye-witnesses to the accident.

The accident occurred because the victim was positioned in the pinch point created by the bunker car support beam as it moved toward the upright channel. The victim received fatal crushing injuries as a result of this accident.

GENERAL INFORMATION

Jim Walter Resources, Inc. No. 7 Mine, I.D. No. 01-01401, is located on Hannah Creek Road, Tuscaloosa County, Alabama, approximately eight miles from the city of Brookwood. The mine began production on June 1, 1977. The mine operates in the Blue Creek Coal Seam at a depth of 1,700 feet from the surface and has an average mining height of 80 inches.

At the time of the accident, the mine was accessed by six shaft openings, three of which served as intakes and three as returns. The latest laboratory analysis of return air samples at the fans indicates total methane liberation of 6,375,899 cubic feet per day. The ventilation provided by the three exhausting fans totals 2,417,340 cubic feet per minute of air.

The mine operates three shifts per day, seven days per week, producing approximately 17,600 raw tons of coal per day from two advancing continuous miner sections and one retreating longwall section. The two continuous miner sections are ventilated using dual split ventilation and exhausting line brattice. Employment is provided for 314 underground and 101 surface employees. Diesel powered track haulage systems are used to transport personnel and supplies in and out of the mine.

Raw coal material is transported from working sections to the production shaft via conveyor belts and is hoisted out of the mine via skip cars. In lieu of halting or limiting production, an underground bunker is used to store raw coal material when mining produces a greater quantity of material than can be hoisted out of the mine. The raw coal material in the bunker is transferred to the production shaft pocket and ultimately to the skip cars for hoisting out of the mine during periods of decreased production rates.

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

George Richmond	President & Chief Operating Officer
Larry Vines	Mine Manager
John Aldrich	Mine Safety Manager
Gregory Dean	Vice-President - Finance
Fred Kozel	Vice-President - Operations
Richard Donnelly	Vice-President - Engineering
Dale Byram	Manager, Safety and Training

A Safety and Health Inspection was completed by the Mine Safety and Health Administration (MSHA) on March 31, 2004, and another was ongoing at the time of the accident. The Non-Fatal Days Lost (NFDL) injury incidence rate for the mine in 2003 was 5.59 compared to a national NFDL rate of 5.93.

DESCRIPTION OF ACCIDENT

At 7:00 a.m. on Wednesday, June 16, 2004, production crews and Larry Turner, production shaft control room operator, entered the mine via the service shaft elevator. The victim, Kenneth A. Battles, and other outby personnel entered the mine at approximately 7:15 a.m. Alton England, Outby Belt Supervisor, issued work assignments to outby personnel including Battles, Roosevelt Harris, Jaye Jones, Terry Acker, and Larry Whaley. England and three miners, Harris, Jones, and Acker, proceeded to the North Main Belt drive to locate and repair a bad splice in the belt. Turner traveled to the production shaft control room to assume his normal duties, which include manual control of the Butterley 1850-ton bunker system. The control room is located on the southern perimeter of the production shaft between the bunker system and the shaft and is elevated above the mine floor such that the only view is of the belt discharge into the bunker, the top of the bunker system, and a portion of the inside of the cars. Battles did not visit Turner in the control room upon arrival to the bunker area as he normally would, however, Turner did observe Battles cleaning around the bunker between the start of the shift and the time of the accident.

At approximately 9:10 a.m., the control room air conditioner fan motor failed. Whaley, who works with Turner and assumes Turner's duties in his absence, called outside to Cliff Hurley, Surface Supervisor, and requested a replacement motor for the air conditioner and a fan to use until repairs could be completed.

At approximately 9:20 a.m., Battles spoke with Harris for a few minutes at the North Main Belt Header before walking back to the bunker. The North Main Belt Header is approximately 500 feet walking distance from the production shaft control room.

At approximately 9:30 a.m., Hurley sent a fan and a replacement motor into the mine via the auxiliary elevator located in the production shaft. Whaley walked approximately 50 feet to the elevator to retrieve the fan and motor. While walking back to the control room, Whaley observed Battles working from a position on the east side of the upright channel and spoke briefly with him before walking up the steps to the control room. The upright channel was installed for attaching five bunker car location sensors for automatic operation of the bunker cars. The automatic system never functioned properly and the sensors were rendered inoperable by severing the electrical power and communication cables shortly after installation in 1986. The channel was attached to the metal pocket decking and extended upward before angling over the walkway to the catwalk in front of the production shaft control room.

At approximately 9:40 a.m., Whaley was preparing to leave the control room to get Battles to help in removing the air conditioner when Turner and Whaley heard Turner's nickname, "Lumpy", called out above the normal operational noise of the system, which was relatively quiet due to the inoperable air conditioning system. Turner, who

was manually moving the bunker cars in the westward direction using a self-centering joy-stick control, told Whaley to see who was calling his name. Whaley walked down the steps to the mine floor and saw Battles trapped between a vertical 6-inch bunker car support beam and the upright channel. Battles was facing westward in the space between the bunker car support beam and the channel, which ranged from four to six inches due to a slight angle of the channel away from the bunker cars and toward the control room, with a flexible water line pinched between Battles' right hip and the channel. Whaley ran back up to the control room and told Turner to shut everything off. Turner immediately pressed the emergency stop button causing the bunker system and conveyor belts to shut down.

Whaley went back to the accident site and checked Battles' vital signs. Finding no respirations or pulse, he went back to the control room and contacted John Anderson, CO Room Operator, who was stationed in the carbon monoxide monitoring facility (CO Room) on the surface, and informed Anderson of the accident. Anderson contacted Emergency Medical Services and mine personnel working at the North Main Belt drive for assistance at the accident site. Whaley went back down the control room steps and re-examined Battles for signs of life and found no response. Within moments England, Harris, Jones, and Acker arrived at the scene where England began assessing the condition of the victim.

It was determined that removal of the channel using cutting torches would be too time consuming and the decision was made to move the bunker cars in an eastward direction to extricate Battles. Turner activated the system and moved the bunker cars approximately 21 inches to the east, thereby allowing Battles' release from his trapped position. Once released, Battles was laid on the mine floor so that an assessment of pulse and respirations could be made by England. The victim had no pulse and was not breathing. England initiated cardiopulmonary resuscitation (CPR) as Battles was being placed on a stretcher. Resuscitation efforts continued as Battles was carried to a waiting diesel track locomotive and during transport via this locomotive to the service shaft bottom. Company supervisors John Aldrich, Mine Safety Manager, and Gary Allinson, Longwall Coordinator, and UMWA surface electrician Ronnie Clearlock entered the mine and met the locomotive at the Southeast Track Switch and took over the resuscitation efforts. Efforts continued during transport to the surface where Patrick Stines and Baily Price (American Medical Response) and Tim Gray and Jason Whatley (Tuscaloosa County Fire and Rescue Department) gave assistance to Aldrich and Clearlock. Joey DeGeorge and Renee Miller (Alabama Life Saver Helicopter) arrived within minutes and relieved the rescuers. Battles was pronounced dead at the mine at 10:41 a.m., June 16, 2004. The body was transported to Tuscaloosa County Forensics, Tuscaloosa, AL, for autopsy. Preliminary indications are that the cause of death was due to crushing injuries.

INVESTIGATION OF THE ACCIDENT

At 10:45 a.m. on Wednesday, June 16, 2004, John Anderson, CO Room Operator for the Jim Walter Resources, Inc. (JWR), No. 7 Mine, contacted and informed Charles T. Langley, MSHA Supervisory Coal Mine Safety and Health Specialist, of the accident. Charles E. Carpenter, Coal Mine Safety and Health Electrical Specialist, and David H. Allen, Jr., Mining Engineer, were contacted and sent to the No. 7 Mine. John R. Smoot, Coal Mine Safety and Health Inspector, was at the mine when the accident occurred and, upon notification of the accident, issued order number 7681355 pursuant to §103(k) of the Federal Mine Safety & Health Act of 1977 to ensure the safety of miners until an investigation could be conducted. The mine operator ceased production and called all personnel out of the mine. In addition to MSHA personnel, Gary Sparks, Alabama Department of Industrial Relations Mine Inspector, was present during and assisted in the accident investigation. Investigators from the Tuscaloosa County Homicide Unit and the Alabama Department of Forensic Sciences were present during initial interviews conducted on June 16. An underground visit to the accident site was made during which photographs were taken and initial assessments of the conditions and causes of the accident were made.

On Thursday, June 17, 2004, Gary Clark, MSHA Technical Support, joined the investigation team. Interviews continued at the mine and the site investigation continued. The §103(k) Order was modified to allow the operator to conduct examinations of the production shaft and lower shaft levels and to remove the upright channel. After exiting the mine, a discussion was held with representatives of miners, company officials, Sparks, and MSHA regarding the installation of additional safety measures in the bunker area. Upon notification that the examinations had been completed and the upright channel had been removed, Carpenter and Allen re-entered the mine to make a visual examination of the area. The §103(k) Order was modified again to allow operation of the bunker car system provided the operator would prevent miners from accessing the bunker car area while the system is in operation and for the installation of additional safety measures in the area.

Additional interviews were conducted by Carpenter, Allen, and Clark on Friday, June 18, 2004. Carpenter and Clark visited the accident site and observed that an audible alarm system had been installed. This system emits an audible warning prior to the movement of bunker cars. Strobe lights had been installed previously around the perimeter of the bunker system as a visual warning of impending bunker car movement. The operator ordered additional strobe lights to complement those already in place.

Carpenter and Smoot conducted follow-up interviews on Monday, June 21, 2004.

DISCUSSION

Bunker System Information:

Mined raw coal material is transported via conveyor belt from working sections to the production shaft and through the pocket to the skip cars for hoisting out of the mine. The pocket is a hopper shaped storage bin that allows the coal to gravity flow into the feeders, load cells and into the skip cars. There are two skip cars, each having a hoisting capacity of approximately 22 tons.

A Butterley 1850-ton raw coal material storage bunker system is used to store mined materials during times when production is greater than the hoisting ability of the skip cars. The system is comprised of 31 connected rail-mounted open-bottom cars that are moved westward to fill and eastward to empty.

A 60-inch wide flat conveyor belt beneath the open-bottom bunker cars acts as a seal. This conveyor belt structure is not powered and is used only as a means to hold mined material in the bunker cars. Bunker cars are emptied by moving the cars eastward over the discharge end of the bunker seal belt, thereby allowing the material to gravity feed into the pocket.

An operator positioned in an elevated control room uses manual controls to fill or empty the bunker cars as needed. Initially, an automatic system was installed to fill the bunker cars. Sensors were installed on an upright steel channel for tracking car position and movement. Operational problems with the automatic system led to the system being taken out of service shortly after its installation in 1986. Since that time, the system has been operated manually by movement of a self-centering joystick control in the desired direction of bunker car travel.

Accident Scene Information:

The channel on which the automatic car position sensors were installed was attached to the pocket structure and extended upward and angled over to the elevated control room structure. The space between the upright channel and the bunker car support beams ranges from four inches to six inches. Ample walkway and work space were provided to the north, east, and west of the upright channel.

The accident team conducted tests of the electrical, hydraulic, and mechanical bunker operation systems. The system utilizes hydraulically operated winches that are powered by 480-volt drive motors. The winches are controlled manually through a Siemens programmable logic controller located in the production shaft control room. Individual and coordinated testing of the electrical, hydraulic, and mechanical systems

indicated that the bunker car system was operating properly and within operational parameters at the time of the accident.

The bunker cars move at approximately 10 feet per minute in each direction. A short delay of approximately three seconds occurs between activation of the bunker car movement control lever and movement of the bunker cars. Bunker car movement stops immediately upon release of the control lever with no observed creeping. Blue strobe lights had previously been installed as a visual warning device to warn miners in the area that the bunker cars are about to move. One of these lights was found to be inoperative but was out of the line of sight of the victim and did not contribute to the cause of the accident.

The water hose being used to wash material away from the discharge end of the bunker seal belt was initially on and was turned off by a miner summoned to help. The hose was pinched between the right side of the victim and the upright channel. Initial site inspection revealed that the area was still damp, indicating the hose was being used to wash material into the pocket.

The view from the elevated production shaft control room is limited to the conveyor belt discharge into the top portion of the bunker cars and of a portion of the inside of the bunker cars. The accident occurred directly below the control room and the accident site is not visible from inside the control room. The victim normally contacted the control room operator prior to performing duties he considered to be potentially hazardous. No such contact was made prior to the accident.

The discharge end of the bunker seal belt is located southwest of the upright channel. The best vantage point for viewing the bunker seal belt discharge was on the east side of the upright channel facing the southwesterly direction. The most advantageous work position for washing material away from the bunker seal belt discharge into the pocket was on the east side of the upright channel due to the angle and visibility.

Training:

The victim had over 22 years total mining experience, all of which were as a General Inside Laborer at the No. 7 Mine. Signed records provided by the operator indicate that required Part 48 training had been given to and received by the victim. Records show that the victim received production shaft cleaning hazard recognition training on September 13, 2002. The victim completed annual refresher training on March 6, 2004.

Accident Scenario:

The victim's normal work duties included cleaning the area around the bunker and he was performing his normal job activity when the accident occurred. The victim was washing loose raw coal material away from the discharge end of the 60-inch wide bunker seal belt beneath the bunker car system and into the pocket. The victim was observed to be working from a position just east of the upright channel shortly before the accident and was likely working from this position when the accident occurred (see Appendix D). This was the best vantage point for seeing the discharge and for washing material away from the discharge into the pocket. The victim was likely leaning forward in the direction of the discharge with his right side and/or shoulder against the upright channel.

The bunker cars were being moved westward. A steel bunker car support beam likely contacted the victim's back. Due to the probable forward lean of the victim, the steel beam caused the victim to be trapped such that he could not back out of his position. The victim could not move forward due to the tight space (four to six inches) between the bunker car structure and the upright channel.

The continued westward movement of the bunker cars likely caused the victim to become entrapped between the upright channel and the steel bunker car support beam. When found, the victim was facing westward. There were no eye-witnesses to the accident.

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.

1. *Causal Factor:* The upright channel on which the automatic car location/position sensors were installed was not removed from the area though the system had been inoperative since shortly after installation.

Corrective Action: The mine operator removed the upright channel.

2. *Causal Factor:* The number of strobe lights installed to act as a visual warning to miners that the bunker cars were about to move were not adequate.

Corrective Action: The operator installed additional strobe lights and an audible warning system that sounds once the bunker movement control lever is activated and before the bunker cars move. In addition, a radio-linked

pull-cord system was installed along both sides of the bunker. This pull-cord system stops movement of the bunker cars if the cord is pulled or if a receiver fails to detect the radio signal. The operator has also implemented new procedures for personnel working in the bunker area. These procedures include making initial contact with the control room operator to let the operator know the location of work, the number of people performing the work, and the type of work to be performed. These work crews will have radio communication with the control room operator. The procedures also require that the strobe lights, audible alarm, and pull-cord systems be checked for proper operation by the control room operator at the beginning of the operator's shift.

CONCLUSION

On June 16, 2004, Kenneth D. Battles sustained fatal injuries while performing his normal job duties from a position in which a pinch-point between a stationary upright steel channel and a bunker car support beam was created by movement of the bunker cars. There were no eye-witnesses to the accident. Contributing causes to the accident include leaving the upright sensor channel in place after removing the automatic system from service, inadequate warning devices, and lack of an emergency stop system accessible to miners working around the bunker. No contributory violations were observed during the accident investigation.

Approved By:

Richard A. Gates
District Manager

Date

ENFORCEMENT ACTIONS

On June 16, 2004, order number 7681355 was issued pursuant to §103(k) of the Federal Mine Safety & Health Act of 1977. This order reads as follows:

A fatal accident has occurred at the bunker area of the mine. This order is issued to assure the safety of any person at the mine until an examination and investigation is made to determine that the area is safe. Only those persons selected from company officials, state officials, the miner's representative and other persons who are deemed by MSHA to have information relevant to the investigation may enter or remain in the affected area.

A notice to provide safeguards number 7682332 was issued pursuant to §314(b) of the Federal Mine Safety & Health Act of 1977 and §75.1403 of Title 30, Code of Federal Regulations, stating:

The Butterley Bunker conveyor system being operated at the production shaft is not being provided with adequate protective devices to warn of imminent movement of machinery. The bunker system is provided with 6 blue flashing lights that are not visible from all work areas along the perimeter of the bunker system. There is no audible indication of intended movement of the cars prior to activation of car movement. The system is not provided with a means to de-energize or de-activate the system in the event of an accident or fall of a miner into the moving equipment. An accident resulting in fatal injuries occurred on June 16, 2004, when a miner was entrapped between the moving bunker cars and an upright steel channel. This area is traveled regularly by miners performing job duties and examinations. An adequate warning system and a method to immediately de-energize the bunker car system would have lessened the potential of a fatal accident.

This is a notice to provide safeguards requiring the bunker car system to be provided with the following:

- 1) Warning lights that are visible from all areas around the bunker car system shall be provided and maintained. These lights are to activate prior to movement of the bunker cars.
- 2) An audible warning system that can be heard above the normal operating noise level of the bunker car system in all areas around the bunker car system shall be installed and maintained. This audible warning system shall activate prior to movement of the bunker cars.
- 3) A system that can be manually activated to stop the moving bunker cars shall be installed and maintained along each side of the bunker car system. This system shall be installed to provide a latching circuit that must be manually re-set after activation.

- 4) The operator shall develop and initiate safe work procedures for working and traveling around the bunker car system. Miners must be trained in the warning systems and in the bunker car movement de-activation system prior to working and/or traveling in the bunker car area.

**APPENDIX A
Persons Participating in the Investigation**

Jim Walter Resources, Inc.

<u>Name</u>	<u>Title</u>
Richard Donnelly	Vice-President - Engineering
Larry Vines	Mine Manager
Dale Byram	Manager, Safety and Training
John Aldrich	Mine Safety Manager
Frank Stewart	Safety Supervisor
Tommy Glenn	Chief Electrician
Frankie Lee	Planning Manager
Jerry McKinney	Outby Manager
Alton England	Outby Belt Supervisor
Teal Tennyson	Outby Electrical Supervisor

United Mine Workers Of America

<u>Name</u>	<u>Title</u>
Thomas Wilson	International Representative
Daryl Dewberry	District 20 International Board Member
Larry Pasquale	District 20 Representative
Keith Plylar	Safety Committee Chairman, Local 2397
Dwight Cagle	Safety Committeeman, Local 2397

**Alabama Department Of Industrial Relations -
Mine Safety And Inspection**

<u>Name</u>	<u>Title</u>
Gary Sparks	Mine Inspector

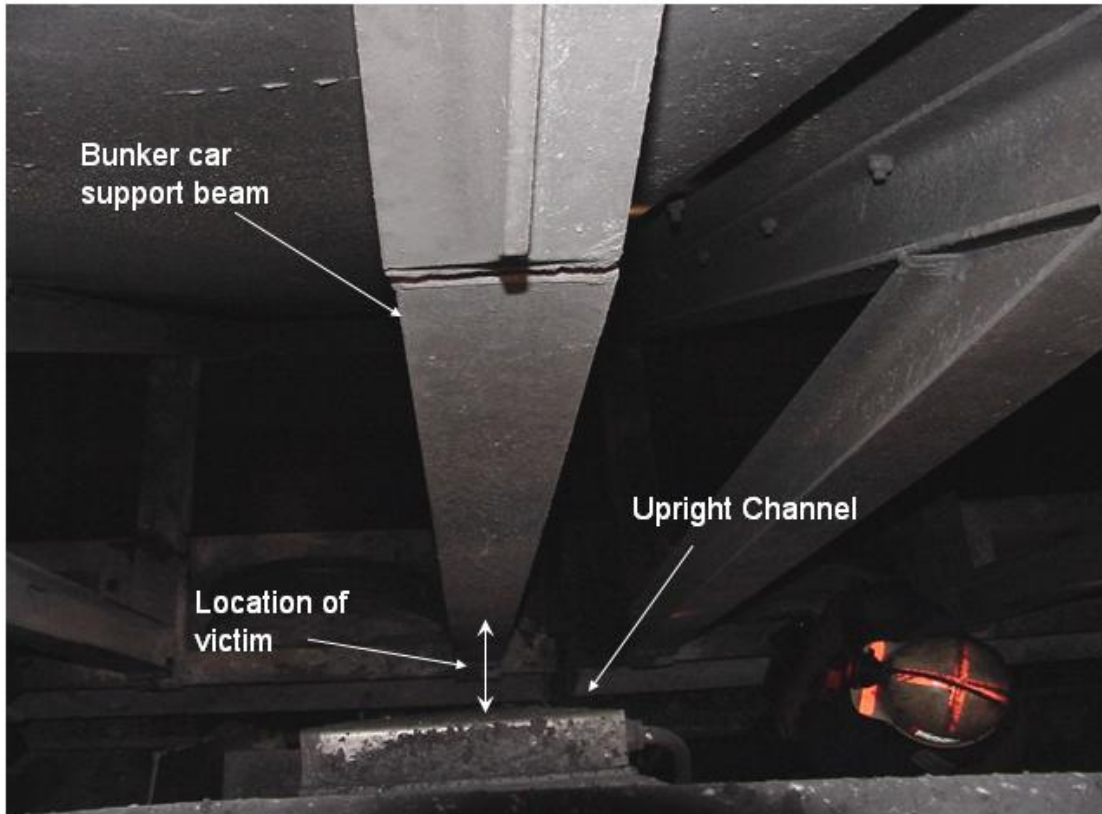
Mine Safety And Health Administration

<u>Name</u>	<u>Title</u>
Gary Wirth	Assistant District Manager
Charles Carpenter	Accident Investigation Team Leader, District 11
David H. Allen, Jr.	Mining Engineer, District 11
John R. Smoot	Coal Mine Safety and Health Inspector, District 11
Gary Clark	Mechanical Engineer, Technical Support, Mechanical and Engineering Safety Division

APPENDIX B
List of Persons Interviewed

<u>Name</u>	<u>Title</u>
Alton England	Outby Belt Supervisor
James Turner	Production Shaft Control Room Operator
Larry Whaley	General Inside Laborer
Roosevelt Harris	General Inside Laborer
Jaye Jones	General Inside Laborer
Terry Acker	General Inside Laborer
Mark Dubose	General Inside Laborer

APPENDIX C
Photograph



View from the catwalk in front of the production shaft control room above the accident site.

APPENDIX D
Diagram

