

UNITED STATES  
DEPARTMENT OF LABOR  
MINE SAFETY AND HEALTH ADMINISTRATION

COAL MINE SAFETY AND HEALTH

REPORT OF INVESTIGATION

Surface Coal Mine

Fatal Powered Haulage Accident  
September 9, 2003

Belle Ayr Mine  
RAG Coal West, Inc.  
Gillette, Campbell County, Wyoming  
ID No. 48-00732

Accident Investigators

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Staff Assistant

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Release Date: December 10, 2003

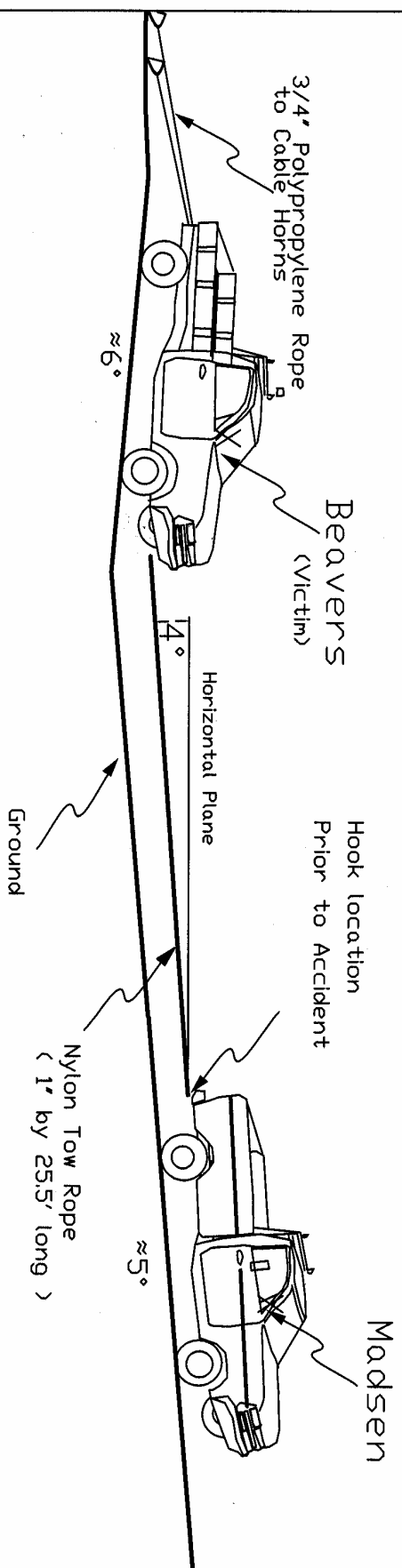
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POWERED HAULAGE FATAL ACCIDENT  
BELLE Ayr Mine ( 48-00732 )

09-09-2003

(NOT TO SCALE)



## OVERVIEW

On Tuesday, September 9, 2003, at approximately 9:45 a.m., a fatal powered haulage accident occurred at the Belle Ayr Mine. The accident occurred during the move of a Marion Model 301 electric shovel from the top of the coal bench to the overburden bench above. During the move, two shovel oiler/utility persons (oilers), assisted by a motor grader, picked up, moved, and positioned the trailing cable for the shovel. The oilers each used Chevrolet Model K2500 Silverado pickup trucks with hooks welded on rear hitch assemblies to tie to and move cable. The motor grader was used to move the bulk of the cable while the trucks were used to move end segments.

After the shovel started up the ramp to the overburden bench, the victim attempted to pull two "horns" of trailing cable, approximately 400 feet of cable, with one of the trucks to follow the shovel. This truck lost traction in a muddy area at the base of the ramp. The second oiler pulled his truck in front of the victim's truck and they attached a nylon tow rope from a hook on the back of the towing truck to a hook on the front of the victim's truck. On the first attempt to pull the victim's truck, the hook broke off the hitch receiver of the towing truck and projected back toward the victim's truck, striking the windshield in the lower left corner. The hook hit the metal support on the left side of the windshield and deflected into the victim's head, causing fatal injuries. The hook weighed 2.5 pounds.

The use of a hook, welded on the hitch receiver of the towing truck, as the attachment point for the tow rope between the two trucks, created an unsafe operating condition that resulted in the hook fracturing the receiver steel and projecting back towards the truck being towed, causing the accident. The physical orientation of the hook on the receiver frame combined with the direction of the rope's pulling force induced a load that exceeded the structural capabilities of the receiver frame in the area in which the fracture started. The fracture appeared to have initiated in the heat affected zone of the welded area of the receiver frame. The use of a nylon tow rope as the towing device contributed to the cause of the accident as the elongation characteristics of the nylon rope allowed greater energy storage than that which would occur in other types of towing devices.

## GENERAL INFORMATION

The Belle Ayr Mine is a surface sub-bituminous coal mine located approximately 18 miles south of Gillette, Campbell County, Wyoming. The mine was opened in 1973 by AMAX Coal Company, a division of AMAX Incorporated (AMAX). In January 1993, AMAX transferred the Belle Ayr Mine to a newly formed subsidiary called AMAX Coal West, Incorporated. In November 1993, AMAX and Cyprus Minerals merged and AMAX Coal West, Inc. became a part of Cyprus AMAX Minerals Company. The mine was purchased by RAG Coal West, Incorporated (RAG), the current operator, in July 1999. RAG is a subsidiary of RAG American Coal Company with offices in Linthicum, Maryland. The mine produces an average of 50,000 tons of coal per day. In 2002, the mine produced 17.4 million tons of coal, with 235 employees, 212 of which worked in the pits and surface facilities. The mine works two 12-hour shifts per day, seven days per week.

The mine has one pit. Both the overburden and coal are blasted. The coal seam mined is the Wyodak seam, which is approximately 70 feet thick. The overburden reaches a maximum thickness of 245 feet and is removed by a truck/shovel operation. A Marion 301 shovel and a P&H 4100XPB shovel are used to remove overburden. Terex 360-ton and Caterpillar 240-ton trucks are used to haul overburden. Three Bucyrus-Erie 295 shovels are used at the mine. Two generally are used to load coal and one is a backup for overburden removal. Unit Rig 240-ton trucks are used to haul coal from the pit to a truck dump, where it is crushed, and then conveyed to two train loadout facilities. These facilities load an average of four unit trains per day.

The Mine Safety and Health Administration (MSHA) completed the last regular safety and health inspection at the mine on March 25, 2003. The Non-Fatal Days Lost (NFDL) injury incidence rate, excluding office and contract workers for the mine for the first six months of 2003 was 0.00 compared to a National NFDL rate of 2.20.

The principal officials at the mine were:

Kurt D. Kost	President
Steve Y. Rennell	General Manager of Operations
Christopher M. Jones	Operations Manager
Robert Riggles	Pit Process Manager
Robert D. Davis	Team Coordinator, A-Crew
Harold W. Schickel	Loss Prevention Manager
Ken Kelly	Senior Engineering Technician

## DESCRIPTION OF THE ACCIDENT

On Tuesday, September 9, 2003, the A-crew employees arrived at the mine at approximately 6:40 a.m. for the start of day shift. Crew members received assignments for the shift, attended a short safety meeting with Robert Davis, A-crew Team Coordinator, and then proceeded to the pit for a 7:00 a.m., "hot seat" shift change with night shift.

Brad A. Beavers, victim, and Charley Madsen, both shovel oiler/utility persons (oilers), were assigned to assist with the move of the Marion 301 shovel from the top of the coal bench to the overburden bench above. Joseph Wondercheck operated the Marion shovel and Michael Spade operated a motor grader, which was used to attach to, move, and position the trailing cable for the shovel during the move. Beavers and Madsen operated two Chevrolet K2500 Silverado pickup trucks with hooks welded on rear hitch assemblies to help move end segments of the trailing cable. One of the trucks had a modified flat utility bed (Beavers' truck) while the other had its factory installed, conventional truck bed (Madsen's truck).

The shovel had to be moved on the coal bench approximately 2,500 feet and then up a ramp to overburden bench No. 1. This bench was approximately 60 to 70 feet above the top of the coal bench. The move began at approximately 7:15 a.m. and normally would have taken 2.5 to 3 hours to complete.

As the shovel moved toward the ramp, cable was attached to the motor grader, which pulled the cable and traveled behind the shovel. After passing the location where the cable for the shovel came over the highwall from bench No. 1, cable was dropped from the motor grader to allow the shovel to reach the bottom of the ramp. At the bottom of the ramp a power change had to be made. The shovel's trailing cable was disconnected from the J-box (referred to as a "spider") at the bottom of the ramp and the portion of the cable that extended up the ramp was removed and stored on bench No. 1. The trailing cable directly behind the shovel on the coal bench was disconnected and brought to the bottom of the ramp by the motor grader. Using the utility-bed pickup truck, Beavers pulled the end of the cable and connected it to the spider at the bottom of the ramp. When power was energized to the shovel, the ground monitor failed to work. Beavers disconnected the cable from the spider, removed the first length of cable, and reconnected the cable to the spider. Power was re-energized and the ground monitor worked properly.

The shovel then proceeded up the ramp followed by the motor grader pulling the trailing cable. Due to the location of the motor grader behind the shovel, two "horns" of cable, which connected directly to the spider at the bottom of the ramp, had to be moved using the utility-bed pickup truck. A horn consists

of a semi-circular steel connection that is attached to the cable to prevent kinking and used to pull approximately 200 feet of cable. A nylon rope is used to connect the horns to hooks on the back of the truck.

After the two horns were connected to the hooks on the back of the utility-bed truck, Beavers proceeded in the truck to follow the shovel and motor grader up the ramp. The cable from these two horns would have been laid out quickly on the ramp, as they attached directly to the spider. As the truck traveled through a muddy area at the bottom of the ramp, it lost traction. Madsen pulled the second pickup truck in front of Beavers' truck and they attached a nylon tow rope with braided eyes between the trucks. Madsen connected the tow rope to a hook that had been welded to the right side of the hitch receiver on the towing truck. Beavers connected the rope to the right side hook on the front of his truck. The oilers returned to their trucks and Madsen started to pull Beavers' truck. He stated that he pulled with a slow steady pull (not jerking the rope), and that on the first pull, the hook from his truck broke off. The hook projected back toward Beavers' truck. It struck the top of the hood and broke through the lower left corner of the windshield on the driver's side. The hook struck the metal support on the side of the windshield and deflected into the left front side of Beavers' head, causing severe traumatic head injuries. This occurred at approximately 9:45 a.m.

After the hook broke, Madsen got out of his truck. He noticed a dent in the hood of Beavers' truck and couldn't figure out why Beavers had not gotten out of his truck. He went to Beavers and found him injured and bleeding profusely from the head. Madsen called a "Mayday" alert on the radio, unbuckled Beavers' seatbelt, and attempted to control the bleeding with his hand. He held Beavers until Sheila Hansen, Emergency Medical Technician (EMT), arrived.

Hansen, who was located at the mine office complex, heard Madsen's call and proceeded to the mine ambulance. She met Gary Iverson and Pat Oakley, shop mechanics, en route to the ambulance. They got into the ambulance and Iverson drove to the accident scene, approximately 3.5 miles away. Beavers was unconscious but was breathing and had vital signs. Hansen treated Beavers and they placed him in the ambulance and left for the hospital. The Campbell County Memorial Hospital (CCMH) in Gillette, Wyoming was called and dispatched an ambulance. The ambulances met a few miles from the mine on Bishop Road and Beavers was transferred to the CCMH ambulance where he was treated by two paramedics. The ambulance arrived at CCMH at 10:49 a.m. Beavers was pronounced dead on arrival by the emergency physicians. CCMH is located approximately 18 miles from the mine.

## INVESTIGATION OF THE ACCIDENT

On Tuesday, September 9, 2003, at 10:40 a.m., Harold Schickel, Loss Prevention Manager for RAG, called the Gillette, Wyoming MSHA field office from CCMH and advised Betsy Altenberg, Secretary, that a serious accident had occurred at the mine. Altenberg contacted the District Office and advised Bob Cornett, Assistant District Manager, of the accident. Cornett called Schickel to get additional information. At 11:05 a.m., Schickel called Cornett and advised that the victim had died. Scott Markve, Coal Mine Safety and Health Inspector from Gillette, Wyoming, was dispatched to the mine. He arrived at 11:30 a.m. and issued a Section 103(k) order at 11:40 a.m. Markve was later joined by MSHA Inspector William Younkin from the Gillette, Wyoming office. Markve and Younkin conducted a preliminary investigation of the accident site and obtained copies of pictures taken by the company.

William Denning, Civil Engineer and Staff Assistant to the District Manager; Donald E. Durrant, Coal Mine Safety and Health Inspector from Price, Utah; George Nadzadi, Training Specialist with Educational Field Services from Rapid City, South Dakota; and F. Terry Marshall Jr., General Engineer with Technical Support from Triadelphia, West Virginia, were assigned to investigate the accident. Denning was designated as the Lead Investigator.

On September 10, 2003, the MSHA accident investigation team arrived at the mine. The team conducted a physical examination of the accident site, interviewed persons, and reviewed training records and materials, work procedures, and other records and documents relevant to the accident. Interviews were tape recorded by both MSHA and the Wyoming State Inspector of Mines. The Section 103(k) order was modified to allow the two pickup trucks to be moved to a level dry area of the mine so that a detailed inspection of the trucks could be conducted the next day. This was necessary as the accident site had become extremely muddy due to heavy rains on September 10, 2003.

Additional interviews were conducted on September 11, 2003, and a detailed examination of the trucks was conducted. The Section 103(k) order was modified to allow the trucks to be removed from the mine to an independent garage for disposal. The hitch was removed from Madsen's pickup truck and retained as evidence.

On September 12, 2003, a closeout meeting was conducted at the mine. The Section 103(k) order was terminated as all rear tow hooks had been removed from light service vehicles at the mine and the mine operator was developing a safe method for attaching tow ropes to vehicles.



MSHA conducted the investigation with the assistance of mine management and miners. The investigation was conducted jointly with officials from the Wyoming Office of the State Inspector of Mines.

### DISCUSSION

- 1) TRUCK INFORMATION: The utility bed pickup truck (towed truck, operated by Beavers, victim), company unit number 972.21, was a Chevrolet Silverado K2500, VIN 1GCGK24U4YE177330, 2000 model year. It was weighed after the accident and found to be 7,600 pounds. This truck was found after the accident with the automatic transmission selector in 1<sup>st</sup> gear and the transfer case selector in 4 Low.

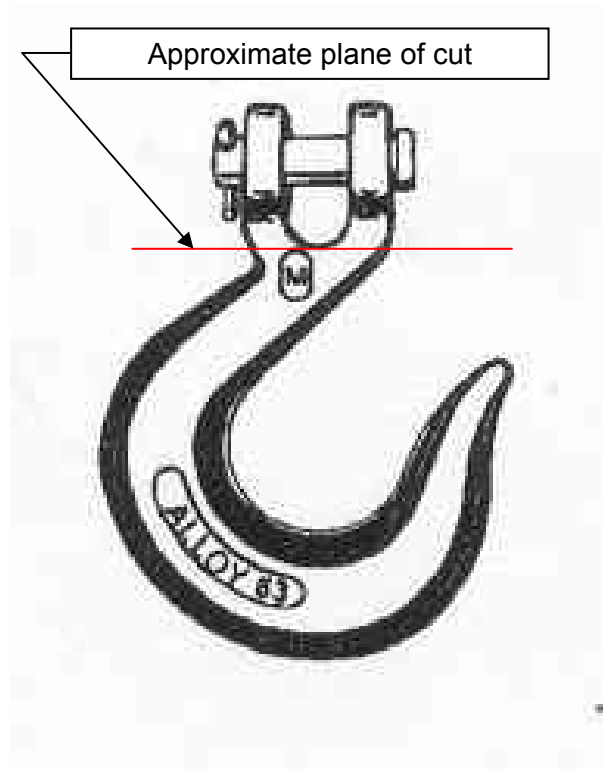
The factory installed, conventional bed pickup truck (towing truck, operated by Madsen), company unit number 968.21, was a Chevrolet Silverado K2500, VIN 1GCGK24U5YE232755, 2000 model year. It was weighed after the accident and found to be 6,680 pounds. This truck was found after the accident with the transfer case selector in 4 High. The driver of the truck indicated that the transmission selector lever was in Drive when the accident occurred.

Both trucks were four-wheel drive (4WD) regular cab pickup trucks with a 133 inch wheelbase, a 6.0 liter engine, a 4L80-E four-speed automatic transmission, a 4.10 axle ratio, a limited slip differential, a two speed 4WD transfer case, and a Gross Vehicle Weight Rating of approximately 8,600 pounds. The trucks were purchased through the Davis Chevrolet-Buick-Cadillac, Inc. (Davis) dealership in Gillette, Wyoming. Davis personnel indicated that the 6.0L engine in these trucks is rated for 300 HP at 4,400 RPM and 360 foot-pounds of torque at 4,000 RPM. Both trucks were equipped with Hankook Model LT245/75R16 Dynamic MT radial tires. All eight tires appeared to be in good condition and properly inflated.

- 2) Beavers' truck was attached to and pulling two "horns" of trailing cable from the Marion shovel. A horn consists of a semi-circular steel connection that prevents kinking and is attached to and used to pull the cable during equipment moves. Normally a horn, when it is being moved, pulls approximately 200 feet of cable. At the time of the accident, not all of the cable on the two horns had been stretched out. As a result, only about 340 feet of cable was being pulled by Beavers' truck at the time of the accident. The cable was a portable power cable, type SHD-GC three conductor, size 4/0 AWG, manufactured by Houston Wire and Cable. It weighed 5.44 pounds per foot. Thus, the 340 feet of cable being pulled by the truck weighed approximately 1,850 pounds.

- 3) TOW ROPE: The tow rope, manufactured by American Manufacturing, Inc., was approximately 25 feet long and made of 1-inch diameter 3-strand nylon rope with hand tucked (braided) eyes on each end. Rope specifications provided by mine personnel indicated that the 1-inch diameter rope had a Safe Working Load Limit of 2,445 pounds, a New Unused Tensile Strength of 22,230 pounds, a weight of 2.5 pounds/10 ft, and 16 percent elongation at Full Tensile. A clevis was attached to one of the eyes. Statements indicated that Beavers had braided the eyes on this tow rope and that he preferred using a nylon tow rope to other types.
- 4) FRAME HOOK: The frame hooks on the front of the utility bed truck (towed truck operated by Beavers) were determined to be an original equipment manufactured (OEM) installation. The hooks were bolted to the frame of the truck, one on each side, using Property Class 10.9 bolts.
- 5) RECEIVER HITCH: The receiver frame on the regular bed truck (towing truck operated by Madsen) was determined to be made of 2-inch diameter steel tubing with a wall thickness of approximately 3/16 inches. A dealer invoice indicated that a hitch package, Davis part number 12495921, was installed on company unit number 968.21. Technical specifications provided by Davis personnel indicate that the receiver hitch was a Class 5 type hitch with a Maximum Trailer Weight of 5,000 pounds and a Maximum Tongue Weight of 600 pounds.
- 6) RECEIVER HOOK: Identification markings on the hook indicated that the hook was originally a Midland (Columbus McKinnon Corporation) alloy clevis type slip hook, grade 63, manufactured for use with a ½-inch chain. The clevis pin eyes had been cut off. Technical specifications indicate the original weight of the hook prior to the eyes being cut off was approximately 2.55 pounds and the original Working Load Limit was 9,400 pounds. An illustration of the original hook is shown in Figure 1, below. Cutting off the pin clevis eyes left a base on the hook approximately ¾ inches thick and 1¼ inches in length. The base of the hook appeared to have then been butt welded to the receiver hitch's tubular frame. The outside circumference of the weld beads made a rectangular shape of approximately one inch by two inches. The approximate orientation of the hook when it was attached to the receiver frame is shown in Appendix C. Columbus McKinnon Corporation legal personnel contacted by investigators stated that this hook was not intended to be welded since it would affect the mechanical properties of the hook and that Columbus McKinnon Corporation does manufacture or distribute weld-on type hooks.

Figure 1: Illustration of hook taken from page 75 of Columbus McKinnon Corporation product catalog number IPC-10B, "CM Chain and Forged Products":



- 7) **FAILURE OF RECEIVER FRAME:** The tubing of the receiver frame failed, allowing the hook to dislodge from the receiver frame. Visual observations indicated the welds remained intact but the tube wall failed around the welds on the sides adjacent to the hook base. This left a section of the tubing, approximately the size of the 1-inch X 2-inch weld filler pattern, attached to the hook base as shown in Appendix D. The failure of the tubing material appeared to have started in the lower left corner area of the hook base as shown in Appendix E.
- 8) Statements indicated that Beavers placed the tow rope on the right front hook of his truck. He placed the eye with the clevis on the hook. Examination of the hook found no obvious markings from the steel clevis, indicating only the rope eye had been placed over the hook. After the accident, the tow rope was found on the ground on the left side of the truck to the rear. See Appendix G for the location of the rope.
- 9) Damage to Beavers' truck, indicated the tow rope flipped back over the hood at an angle from right to left, denting it in the front and marking the hood at an angle from the front/middle toward the back/left side of the hood. The rope bent the front license plate and cracked the Chevrolet emblem in the middle of the grill.

- 10) At the time of the accident, Beavers was crossing from the coal seam to the bottom of the ramp through soft, muddy material, a distance of approximately 60 feet. He had almost exited this material and arrived at the drier roadbed of the ramp when his tires lost traction. His truck stopped on a slight downgrade of approximately 6 degrees.
- 11) Two metal hooks had been welded to the tubular steel hitch receiver on Madsen's truck (towing truck). These hooks were mainly used to attach the ropes from the cable horns when moving trailing cable. The hook on the left side had broken off previously (see Discussion Item 14 for details of this incident), but the area where it was welded was clearly visible, see Appendix F. Madsen attached the tow rope to the hook on the right side when hooking up to Beavers' truck before the accident. This hook broke off during the attempt to pull Beavers' truck and projected back causing the injuries to Beavers. The broken hook was found on the floor of the truck. The weight of this hook was 2.5 pounds.
- 12) WELDS: The quality and/or the type of welds attaching the two hooks to the receiver frame were inconsistent with each other. This is suggested by the weld failure on the driver's (left) side hook on the receiver frame, whereas the weld did not fail on the hook involved in the accident. The weld for the left side hook is shown in Appendix F.
- 13) Madsen's truck was on the ramp on an upgrade of approximately five degrees. The ramp surface consisted of loose dirt with small granular material and small rocks. It was relatively dry at the time of the accident.
- 14) On August 20, 2003, a towing incident occurred in which the hook on the left side of the hitch receiver on the towing truck (No. 968.21) involved in the September 9, 2003, accident was broken off. Information indicated that this truck became stuck in wet, soupy material, deep enough that it seeped into the cab of the truck. A motor grader was called to pull it out. The motor grader backed up to the rear of the truck and a nylon strap was placed between the two vehicles. The strap was put on the hook on the left side of the hitch receiver. When the motor grader pulled the strap, the hook broke off and fell into the muck around the truck. The hook was not retrieved. The strap was then attached around the hitch and the motor grader used its ripper to lift the rear of the truck and extricate it from the muck. The motor grader was then able to pull the truck out of the mud. When lifting the truck, the hitch and bumper were bent in an upward position. The truck was then taken to the garage, washed, and examined. It was determined that no immediate repairs were needed and the truck was put back into

service. No company incident report was prepared due to the limited amount of damage to the truck.

- 15) TRAINING AND EXPERIENCE: Beavers, age 36, had 3 years and 49 weeks mining experience, all at the Belle Ayr Mine. He had 1 year and 48 weeks experience as a shovel oiler/utility person.

Beaver's training records were reviewed and found to be in compliance with 30 CFR Part 48 training requirements. A summary of this training is as follows:

9/29/1999 - Newly Employed Inexperienced Miner Training  
3/11/2000 - Pit Laborer Task Training  
3/28/2001 - Pit Pumper Task Training  
10/03/2001 - Utility Task Training  
March 2003 - Annual Refresher Training

The mine operator conducted training in addition to Part 48 requirements to ensure that employees were "qualified" according to company training guidelines for each job assignment. Beavers successfully completed task training modules for various job assignments. Tasks specifically addressed in company documentation that applied to the work being performed at the time of the accident were: changing of ropes, pulling out stuck trucks, and the coordination of shovel moves from one bench to another. Beavers was issued a company "qualified" status for the utility position in March 2003. This qualification required intensive reviews and mentoring by experienced/qualified employees. This procedure was standard practice for all job positions within the company.

#### **ROOT CAUSE ANALYSIS**

A root cause analysis was conducted. The following causal factors were identified that could have averted the accident entirely or mitigated the severity of the accident:

Causal Factor: The tow rope was attached to a hook welded on the hitch receiver of the towing truck.

Corrective Action: The rope's pulling force was not applied to the hitch, the point of the receiver designed to carry the rated load. RAG removed all rear tow hooks from all light service vehicles and implemented a policy that hooks shall not be installed in this manner on such trucks in the future.

Causal Factor: A nylon rope was used as a tow rope between the two trucks.

Corrective Action: The elongation characteristics of the nylon rope allowed greater energy storage than that which would occur in other types of towing devices. RAG has stopped using nylon tow ropes for towing vehicles and will use other devices such as straps which store less energy when stretched.

Causal Factor: Corrective actions were not taken regarding welded hooks on receivers following the previous incident when the hook on the left side of the receiver broke off during a towing operation.

Corrective Action: Following the September 9, 2003, accident RAG removed all rear tow hooks from all light service vehicles and implemented a policy that hooks shall not be installed on such trucks in the future.

### **CONCLUSION**

The use of a hook, welded on the hitch receiver of the towing truck, as the attachment point for the tow rope between the two trucks, created an unsafe operating condition that resulted in the hook fracturing the receiver steel and projecting back towards the truck being towed, causing the accident. The physical orientation of the hook on the receiver frame combined with the direction of the rope's pulling force induced a load that exceeded the structural capabilities of the receiver frame in the area in which the fracture started. The fracture appeared to have initiated in the heat affected zone of the welded area of the receiver frame. The use of a nylon tow rope as the towing device contributed to the cause of the accident as the elongation characteristics of the nylon rope allowed greater energy storage than that which would occur in other types of towing devices.

### **ENFORCEMENT ACTIONS**

1. Section 103(k) Order No. 7609195 was issued on September 9, 2003, to ensure the safety of persons at the mine until an investigation of the accident could be completed and the mine made safe.
2. Section 104(a) Citation No. 3409165 was issued to RAG Coal West, Inc. on November 20, 2003, for a violation of 30 CFR 77.404(a). The violation stated, "Chevrolet pickup truck, company unit number 968.21, VIN 1GCGK24U5YE23755, was not maintained in safe operating condition in that an alloy clevis type slip hook, grade 63, with the clevis pin eyes cut off, had been welded to the hitch receiver installed on the rear of the truck and was used as an attachment point for tow ropes. This hook broke off during a towing operation on September 9, 2003, and projected back into the truck being towed causing fatal injuries to the driver of that truck. A previous towing incident with truck 968.21

occurred on August 20, 2003, in which a second hook, which was welded on the opposite side of the receiver, broke off during a towing operation. This incident demonstrated that an unsafe condition and safety hazard were present in the use of these welded hooks for towing and no action was taken to correct this safety defect." This violation was considered significant and substantial with moderate negligence.

Approved by:

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Allyn C. Davis  
District Manager

## APPENDIX A

Persons furnishing information and/or present during the investigation were:

### **RAG COAL WEST, INC. OFFICIALS**

Kurt D. Kost	President
Steve Y. Rennell	General Manager of Operations
Christopher M. Jones	Operations Manager
Robert Riggle	Pit Process Manager
Robert D. Davis	Team Coordinator, A-Crew
Harold W. Schickel	Loss Prevention Manager
Ken Kelly	Senior Engineering Technician

### **RAG AMERICAN COAL HOLDING, INC.**

Charles Burggraf	Director Safety
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### **RAG WYOMING LAND COMPANY**

Steven R. Laird	Manager, Land, Legislative, and Public Affairs
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### **RAG COAL WEST, INC. EMPLOYEES**

Jeffrey D. Bergenstock	Shovel Operator/Shovel Oiler
Charley R. Madsen	Utility Person/Shovel Oiler
Timothy M. Strawn	Miners Representative, Fueller/Mechanic
Michael E. Spade	Motorgrader Operator
Joseph Wondercheck	Shovel Operator

### **SECURITAS USA**

Sheila M. Hansen	EMT
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### **WYOMING DEPARTMENT OF EMPLOYMENT OFFICE OF THE STATE INSPECTOR OF MINES**

Donald G. Stauffenberg	State Inspector of Mines
Tom McDonald	Deputy Inspector of Mines
Robert L. Solaas	Deputy Inspector of Mines

### **MINE SAFETY AND HEALTH ADMINISTRATION**

Allyn C. Davis	District Manager
William G. Denning	Staff Assistant
Donald E. Durrant	Coal Mine Safety & Health Inspector
George Nadzadi	Training Specialist, Educational Field Services
F. Terry Marshall Jr.	General Engineer, Technical Support



## **APPENDIX B**

Persons interviewed during the investigation were:

### **RAG COAL WEST, INC. OFFICIALS**

Harold W. Schickel	Loss Prevention Manager
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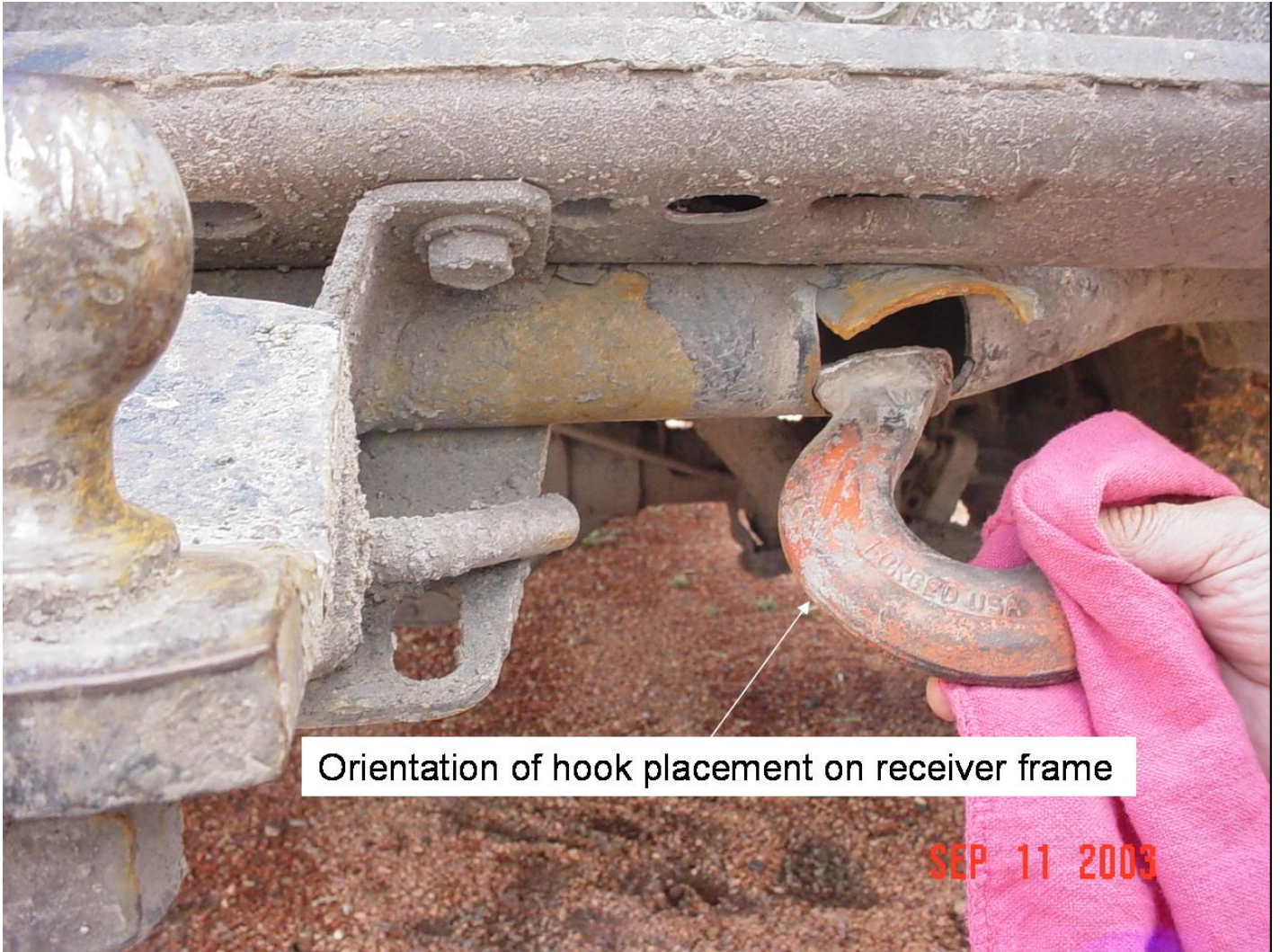
### **RAG COAL WEST, INC. EMPLOYEES**

Jeffrey D. Bergenstock	Shovel Operator/Shovel Oiler
Charley R. Madsen	Utility Person/Shovel Oiler
Timothy M. Strawn	Miners Representative, Fueller/Mechanic
Michael E. Spade	Motorgrader Operator
Joseph Wondercheck	Shovel Operator

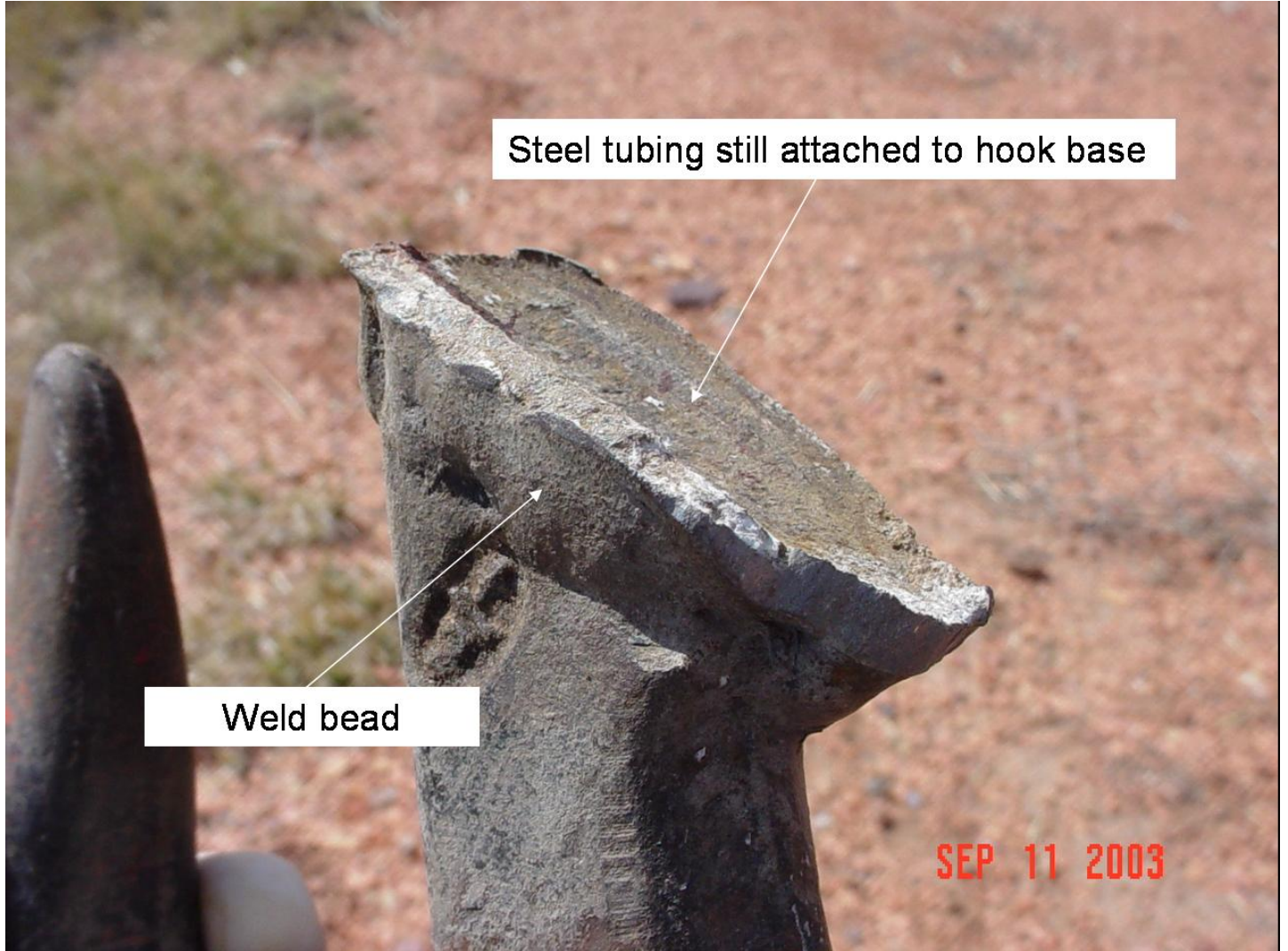
### **SECURITAS USA**

Sheila M. Hansen	EMT
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APPENDIX C

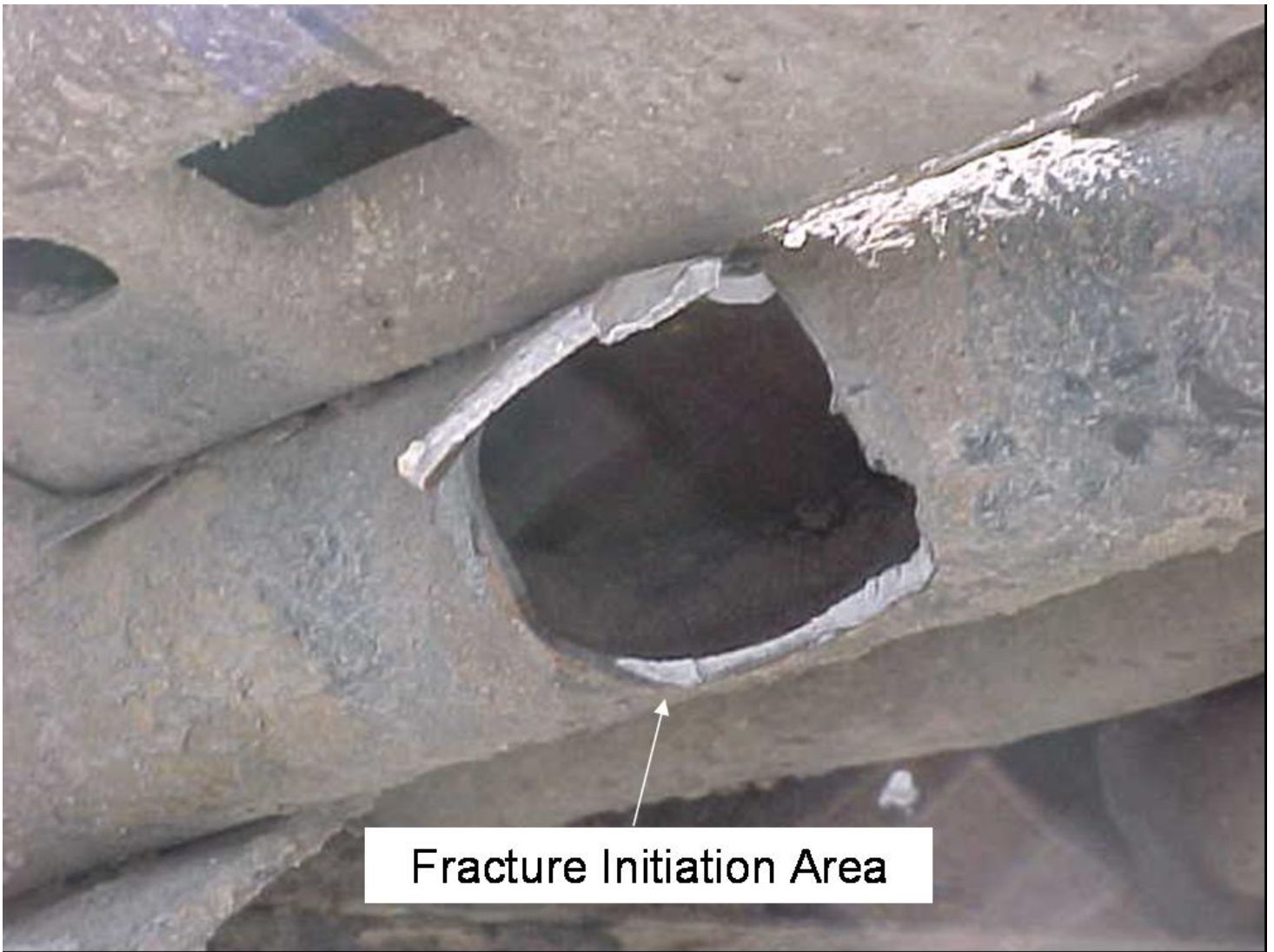


APPENDIX D





APPENDIX E



APPENDIX F



