

**UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION**

District 9

**Accident Investigation Report
(Underground Coal Mine)**

Fatal Explosion of Vessel Under Pressure Accident

**Star Point No. 2 (ID No. 42-00171)
Cyprus-Plateau Mining Corporation
Price, Carbon County, Utah**

September 20, 1989

by

**Dale L. Hollopeter
Coal Mine Safety and Health Inspector**

**Originating Office - Mine Safety and Health Administration
Coal Mine Safety and Health, District 9
P.O. Box 25367, DFC, Denver, Colorado 80225-0367
John M. DeMichiei, District Manager**

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Authority—This report is based on an investigation made pursuant to the Federal Mine Safety and Health Act of 1977, Public Law 91-173, as amended by Public Law 95-164.

Section A—Identification Data

1. Title of investigation: Fatal Explosion of Vessel Under Pressure Accident	2. Date MSHA investigation started: 9/20/89
3. Report release date: 11/27/89	4. Mine: Star Point No. 2
5. Mine ID number: 42-00171	6. Company: Cyprus-Plateau Mining Corporation
7. Town, County, State: Price, Carbon, Utah	8. Author(s): Dale L. Hollopeter

Section B—Mine Information

9. Daily production: Approx. 9,700 tons	10. Surface employment: 29
11. Underground employment: 153	12. Name of coalbed: Wattis, Blind Canyon, and Hiawatha
13. Thickness of coalbed: About eight, nine feet, and two to seven feet, respectively	

Section C—Last Quarter Injury Frequency Rate (HSAC) for:

14. Industry: 8.21	15. This operation: 1.73
16. Training program approved: Yes	17. Mine Profile Rating:

Section D—Originating Office

18. Mine Safety and Health Administration Coal Mine Health and Safety District No. : 9	Address: P.O. Box 25367, DFC Denver, CO 80225-0367
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Section E—Abstract

On Wednesday, September 20, 1989, at about 6:00 a.m. an explosion of vessel under pressure accident occurred in the 4th East Section, where longwall equipment was being recovered. Paul D. Leonard, having about five years and seven months experience as a Longwall Production Foreman, received injuries when he was struck by an attached Longwall Shield Support emulsion return line (hydraulic hose) during the sudden release of pressure within the emulsion return line. The accident occurred when Leonard attempted to release the accumulated pressure within the emulsion return line by sawing into it with a hacksaw.

Section F—Mine Organization

Company officials:	Name	Address
19. Vice Pres. and Gen. Mgr.	George C. Trevorrow, Jr.	P.O. Drawer PMC Price, UT 84501
20. Manager of Operation	William E. Snyder	"
21. Director of Safety	Ernal A. Shaw	"
22. Principle officer—H&S:	George C. Trevorrow, Jr.	"
23. Labor Organization:	None	
24. Chairman—H&S Committee:	Not applicable	

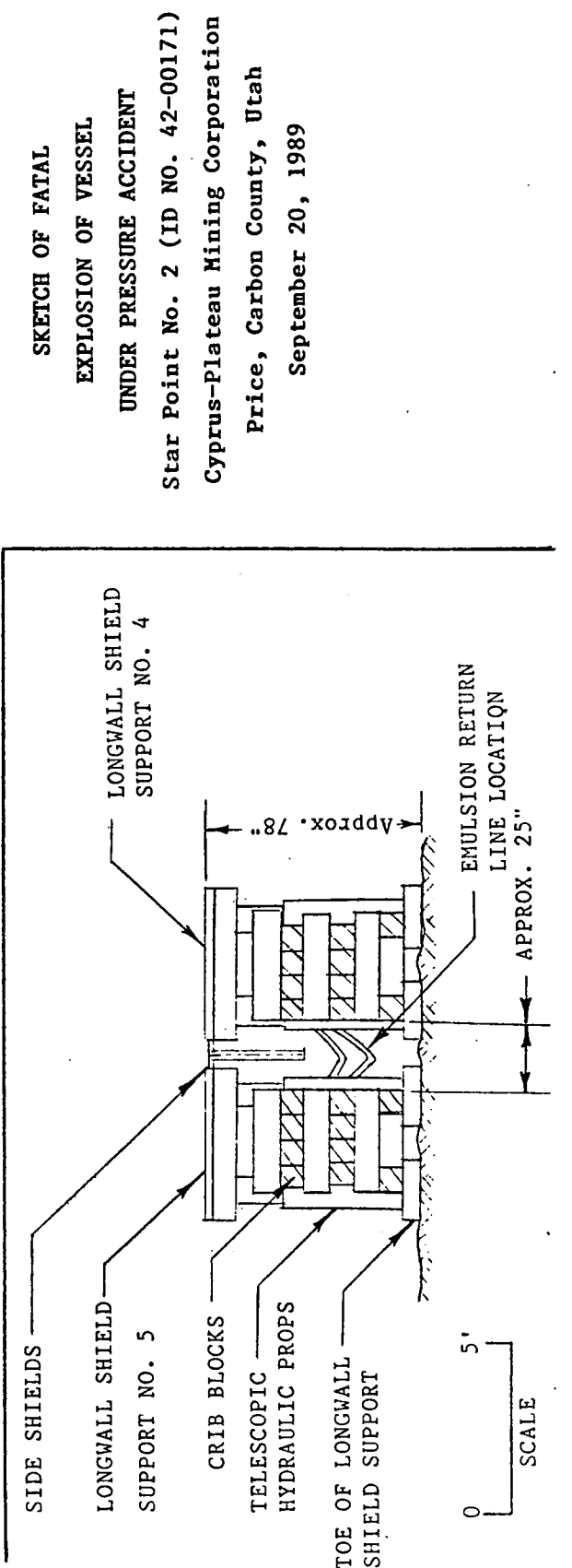
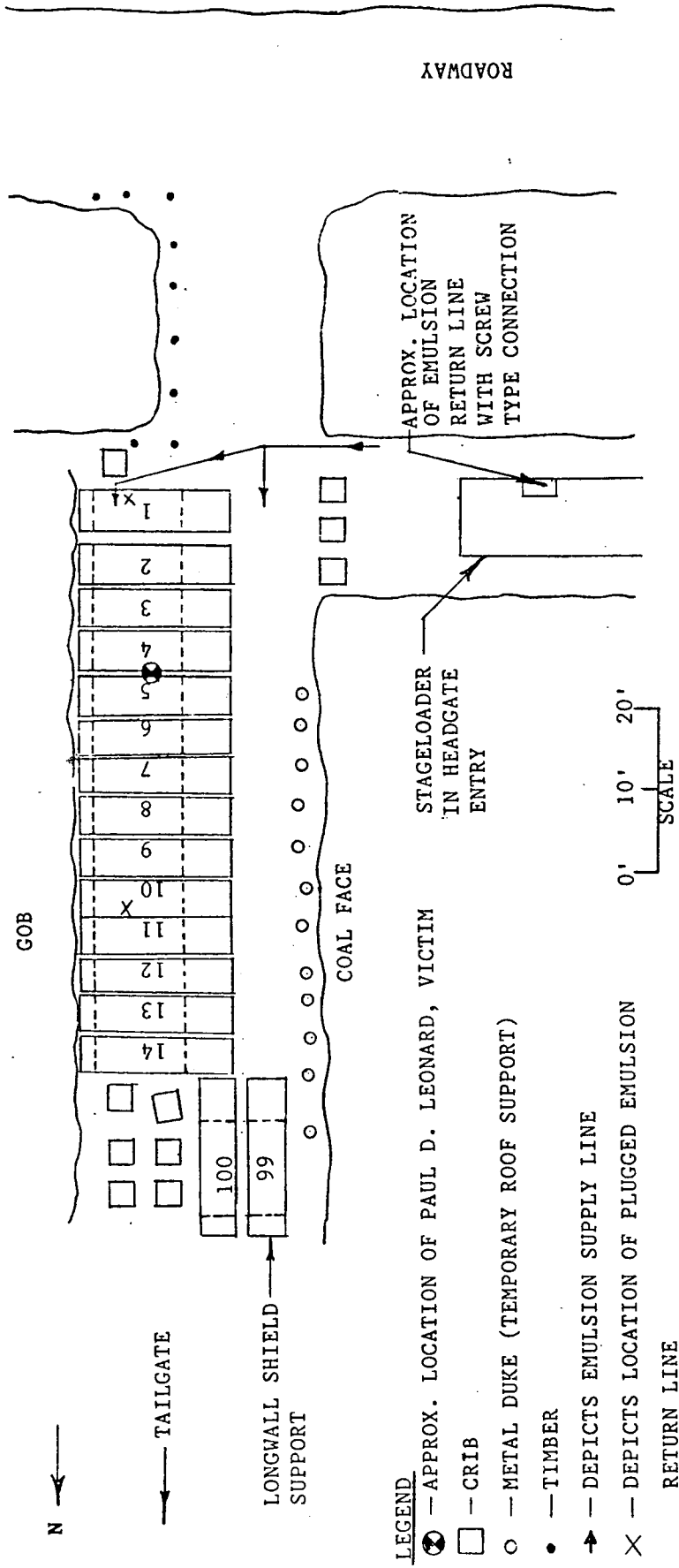


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GENERAL INFORMATION

The Star Point No. 2 mine, Cyprus-Plateau Mining Corporation, is located about 22 miles southwest of Price, Carbon County, Utah.

The Star Point No. 2 mine was opened in 1975 by U.N.C. Plateau Mining, a subsidiary of United Nuclear Corporation, by rehabilitating the Lion Coal Corporation's Nos. 1 and 2 Mines. The Nos. 1 and 2 Mines were closed in 1963 after operating continuously since 1911. Getty Oil Company purchased the property in 1982, and operated as Getty Mining Company until 1986, when Cyprus-Plateau Mining Corporation purchased the property. Cyprus-Plateau Mining Corporation is a subsidiary of Cyprus Western Coal Equipment Company.

The Star Point No. 2 mine is the only active underground coal mine operated by Cyprus-Plateau Mining Corporation. Mineable coal reserves are in the Wattis, Blind Canyon, and Hiawatha seams. The main access to the underground workings is through the Main West drift openings located in Wattis Canyon.

Four sets of rock tunnels connect the three seams underground. Four shafts have been driven to connect the seams for ventilation purposes. Present mining is in the Wattis and Blind Canyon seams. Longwall panels are being developed east off of the Main South entries in the Wattis seam. One longwall panel, 5th East Section off Main South, is in the start-up phase for retreat longwall mining. A two-entry longwall section, 12th Left, is being developed in the Blind Canyon seam.

The mine operates on two production and one maintenance shifts daily, Monday through Friday. The production and maintenance crews rotate between day shift (7 a.m. to 3 p.m.), afternoon shift (3 p.m. to 11 p.m.), and graveyard shift (11 p.m. to 7 a.m.) every two weeks.

The 4th East Section, longwall retreat mining, commenced June 1, 1989, and was completed September 13, 1989. The 4th East Section used 104 Longwall Shield Supports (shields) as roof supports along the 520-foot face. The recovery of the 4th East Section began on September 13, 1989. On the afternoon shift of September 18, 1989, recovery of the shields began at the tailgate entry. Shields were then transported to the 5th East Section, longwall start-up area. The longwall recovery and start-up crews were on a nine-hour shift. Each crew was relieved of its duties by the oncoming crew at the section; thereby, having the crew at the section for a full eight hours. The crews would rotate between shifts every two weeks.

The principle mine officials are:

George C. Trevorrow, Jr.	Vice President and General Manager
William E. Snyder	Manager of Operations
Ernal A. Shaw	Director of Safety
Steve Rigby	Underground Superintendent
Kerry Jensen	Longwall Coordinator
Max Davis	Maintenance Coordinator

The average daily coal production is approximately 9700 tons. The mine employs 182 employees; 153 underground and 29 on the surface.

The mine uses the continuous-mining machine method to develop longwall panels, development and longwall retreat mining method for the extraction of the longwall panels.

The last regular safety and health inspection at the mine was completed September 15, 1989.

DESCRIPTION OF ACCIDENT

Paul D. Leonard, Longwall Production Foreman and victim, entered the Star Point No. 2 mine about one-half hour prior to the start of the 11 p.m., September 19, 1989, graveyard shift to obtain information concerning the activities of the 4th East and 5th East Sections. The 4th East and 5th East Sections' crew entered the mine at about 11 p.m., traveled to their assigned work stations and commenced work.

The 4th East Section had 32 Longwall Shield Supports (shields) remaining to be recovered and transported to the 5th East Section. Shields Nos. 32 through 25 had already been de-hosed from the main emulsion supply line and emulsion return line. Routine recovery work of pulling shields, building cribs, and unloading and stacking crib blocks continued until about 3:30 a.m., September 20, 1989.

Leonard at this time informed David W. Dimick, Shearer Operator, to de-hose enough shields to be recovered in the remainder of the shift. Leonard then turned the main high-pressure emulsion supply-line valve off at the headgate area. Dimick then bled the pressure off the emulsion supply line, removed the bleed-off hose and then installed it on Shield No. 10. The return line plug was also removed and installed at the manifold of Shield No. 10. Shields Nos. 24 through 11 were then de-hosed and the emulsion supply line to the shields was pressurized.

A load of crib blocks was brought into the 4th East Section around 5:30 a.m., September 20, 1989. The crib blocks were to be stacked on the toe of the remaining shields and between them. Shields, Nos. 10 to 1, needed to be de-hosed prior to the crib blocks being stacked on the toes of the shields.

Dimick had Ernie M. Martinez, Shearer Operator, start the de-hosing of the shields. The pressurized emulsion supply hose was turned off and depressurized and then the bleed-off hose was removed. Martinez attempted to remove the staple lock to the emulsion return line plug on the Shield No. 10 manifold, but could not remove it. Martinez, not able to remove the staple lock, informed Leonard. At this time, Dimick attempted to use a "buggy bar or heal bar" to remove the staple lock, but could not remove it. Andy Peterson, Mechanic, and Henry G. Mills, Longwall Setup, also attempted to remove the staple lock with a "heal bar" but could not remove it. Reportedly, all persons realized that the emulsion return line had pressure in it. Leonard then telephoned Larry C. Swassey, Longwall Mechanic, who was in the 5th East Section to obtain information on how to relieve the pressure. Swassey suggested to Martinez, who was now on the telephone, that turning the emulsion pumps off may allow emulsion fluid to bleed back through a shield valve bank. Leonard could not reach David J. Spears, Tailgate Operator, by telephone at the underground pump house to have the emulsion pumps shut off. A suggestion was then made by a crew member to unscrew the coupling of the emulsion return line at the stageloader motor. Peterson could not loosen this coupling with a pair of large channel-lock pliers so Leonard left to get a pipe wrench. Prior to Leonard leaving he instructed Mills and Dimick to continue the shield recovery since there were about seven shields which could be recovered. Martinez at this time suggested sawing through the emulsion return line with a hacksaw, but Mills warned against it because of the pressure. Peterson then loosened the connection and emulsion fluid began to flow out of the coupling connection. Mills and Peterson then checked the emulsion return lines at the shields and found that they still contained pressure. Also during this period of time, crib blocks were being stacked at the toes of the shields. Mills then left, pulled another shield with the Petitto machine and transported it to the roadway entry for transfer to a shield hauler, being operated by Ricky Riche, Headgate Operator. Leonard at this time informed Riche that the staple lock in the emulsion return line could not be removed. Leonard then assigned Peterson to operate the shield hauler and Riche to assist. Riche informed Leonard that there was pressure in the emulsion return lines. Riche then had Martinez trace the shield emulsion return lines to determine if a valve had been plugged. Riche also traced the emulsion return line and then went to the headgate to look for a pressure relief valve in the emulsion return line. Riche, finding the location where the pressure relief valve was normally installed, traced the emulsion return line back to the shields. At this time both Riche and Martinez found a plug in the manifold for the emulsion return line at Shield No. 1. Riche informed Leonard that the emulsion return line had probably become pressurized when a shield valve bank was activated. Leonard then instructed Riche to check the staple locks on the emulsion return line. Riche used a "buggy bar" on the staple locks and could not remove them. Riche made the suggestion to Leonard to turn off the emulsion pumps in an attempt to bleed the pressure back through a leaking shield valve banks, or to cut a line. Leonard reportedly instructed Riche to pull the staple lock which was only halfway inserted in the plug at Shield No. 1. Riche refused because pulling the staple lock would cause the plug to shoot out like a "bullet." Leonard then grabbed a hacksaw and wanted Riche to use it to cut the emulsion return line. However, Riche again refused because of the pressure in the line. Leonard reportedly stated that he would do it and then walked away. Riche then turned the emulsion supply line valve off. About this time Spears walking

past Leonard to help Roland Tallerico, Propman, and Dimick, set cribs, saw a hacksaw in Leonard's hand.

At about 6 a.m., September 20, 1989, the accident occurred. Leonard was bending or kneeling over the emulsion return line between Shield Nos. 4 and 5 attempting to cut into it to relieve the pressure. Apparently, when the emulsion return line was cut into, the sudden release of pressure caused the emulsion return line to break and strike Leonard on the left front head area. Miners in the area, hearing and seeing what had occurred to Leonard, immediately administered first aid. The miners then transported Leonard, who was unconscious, from the mine in the bed of a diesel pickup truck and then transferred him to the mine's ambulance. Leonard was then transported to the Castleview Hospital in Price, Utah, where he was pronounced dead.

PHYSICAL FACTORS INVOLVED

The Star Point No. 2 Mine, Cyprus-Plateau Mining Corporation, current roof control plan was approved by the Acting District Manager on September 18, 1989. The roof control plan contained a Shield Recovery Plan. In accordance with the Shield Recovery Plan, Shields Nos. 104 to 101 were removed from the face area through the tailgate entry. Shields Nos. 100 and 99 were moved into the face area and turned toward the headgate. These shields are trailing shields for subsequent shield recovery and serve as support shields for additional shield recovery. The remaining shields are recovered by pulling them from their position into the empty conveyor space and turning them toward the headgate. Each shield is then pulled along the remaining shield line to the headgate roadway. As the shields are removed, the trailing shields are pulled forward into the empty shield space, as roof support. On the gob side of the trailing shields two cribs are set perpendicular to the face. Also, on the face side and in front of the trailing shields, a single row of metal dukers are set as additional roof supports on about five feet spacing.

The shields used are Westfalia Lünen Panzerschild, Type WS 1.7, having a supporting capacity of about 560 tons. Each shield contains two telescoping hydraulic props of the double-acting type. Pressurized fluid is required to raise or lower the props.

Each shield has a valve bank which uses a "Piano-Key" control system. The control system uses seven pilot valves to control the function of the shield. During shield recovery the control system is set to operate each shield independently. Behind the telescoping props on each roof shield, is a rectangular shaped manifold which is used to connect the supply lines leading from shield to shield and contains the outlets of these lines to the respective controls or cylinders. A check valve is positioned in the outlet of the emulsion return line to prevent malfunctions which might be caused by back pressure in the emulsion return line. The tailgate side of the manifold has four possible connections; one high pressure, one low pressure, and two return connections. The headgate side of the manifold has five possible connections; two high pressure, two low pressure, and one return connections. Each line connected to the manifold is held in place by a staple lock. The staple lock is metal wire, shaped in a "U" configuration, and inserted through the manifold and a groove in the line coupler. The

emulsion high-pressure supply line and return line connections are readily distinguishable by the larger-size connection terminals. The emulsion supply line is about one and one-half inches in outside diameter and the emulsion return line is about two inches in outside diameter. Reportedly, the emulsion return line should contain no pressure in it. Normally, during shield recovery, the manifold at the furthest tailgate shield is plugged so that the emulsion fluid released during pilot valve operation, returns to the emulsion tank via emulsion return lines, or is allowed to flow to the ground at Shield No. 1. Reportedly, if the manifold is plugged at the furthest tailgate shield and at the closest headgate shield, a closed fluid circuit is created. The emulsion return line of the shield would then receive the same pressure as the emulsion supply line when a "Piano-Key" control is activated.

Published material indicates that the emulsion supply line would contain about 4630 psi when pressurized. Readings on the pressure gauges of the No. 1 and No. 2 emulsion pumps in the underground pump room indicated pressures of 3850 to 4116 psi, respectively. In a manual prepared by the manufacturer a section entitled Safety Measures for Maintenance and Repair stated in item "1. Depressurization of the hydraulic system", "Before carrying out any repairs on hydraulic components it is absolutely necessary to depressurize the respective section of the hydraulic system. For this a good knowledge of the hydraulic flow plan is indispensable." Also in General Rules it stated in part ". . . screw-type fittings should never be recovered under pressure (danger of accidents!) . . ." Also, the mine operator provided a written Training Schedule for the longwall move and in the General Safety Precautions, item 12., it states "The attached safety procedures concerning hydraulic repairs need to be understood and followed through by everyone involved." The attached "Safety Procedures Hydraulic Repairs," dated February 8, 1985, on Mining Progress, Inc. letterhead states, in part, "(7) If you are changing a hose or component and you have done all of the things listed above and the hoses are very tight and the staple is very tight, recheck the procedure. If after checking there is still pressure in the system check with your foreman before doing anything else. REMEMBER: THE HYDRAULIC PRESSURE WE USE IS 315 BARS OR 4630 PSI."

The wooden blocks used for cribbing were about 8 inches by 8 inches by 36 inches. Crib blocks were stacked on the toes of Shields Nos. 13 through 4. The crib blocks were stacked six to seven layers high which would be higher than the "Piano-Key" control system. The top row of crib blocks were removed from the stacked blocks after the accident, in the event the roof shield should lower. The top row of crib blocks present on the shields were from about one to seven inches from the "Piano-Keys" control system.

The emulsion return line coupling near the stageloader motor was loosened and had emulsion flowing out of it. This emulsion apparently was the fluid left in the return line going to the emulsion tank, or that which had flowed back from the emulsion tank in the pump room. The emulsion flowed from the coupling because of the difference between the points due to the elevation.

The high-pressure emulsion supply line enters the 4th East Section face area by way of the headgate conveyor belt entry. Just outby Shield No. 1 a tee connection was installed with control valves inby the tee. One emulsion supply line was connected to the Shield No. 1 manifold and the other emulsion supply line was run to the trailing shields to be used to lower and

raise the telescoping props of the de-hosed shields. An additional valve was located in the emulsion supply line between Shields Nos. 6 and 7 and one in the emulsion supply line to the trailing shields.

At the accident area, between the Shields Nos. 4 and 5, a hacksaw and safety glasses were found on the mine floor. The hacksaw did not have a blade in it. Persons providing information stated that after the accident two pieces of the blade were found. The emulsion return line was about 118 inches in length with manufacture markings of Aerogquip-O-E-HGA-I-2ST-DIN-DN32-483. The return line is reportedly rated at 12,000 psi. The return line walls were reinforced with steel braiding. The emulsion return line lower dip, between the shields, was about 11 inches from the mine floor. A complete diagonal tear in the emulsion return line of about three and one-half inches in length was located to the rear of the line and at the lower dip area. The emulsion return line had no other remarkable damage to it. Crib blocks were located on the toes of Shields Nos. 4 and 5. The crib blocks were spaced about 25 inches apart. Also there was about 10 inches spacing between the adjacent shield telescoping props. The return line was in an area that was about four feet ten inches in height.

Persons providing information during the accident investigation believe that Leonard knew the emulsion return line contained pressure. They also felt that Leonard did not realize it contained the high pressure of the emulsion supply line.

Reportedly this was the tenth longwall recovery operation. All the miners involved had experience recovering shields. The shield recovery for the 4th East Section was started on Monday, September 18, 1989, on the afternoon shift. The accident occurred during the fifth shift of shield recovery. Reportedly, there was no rush to have the shields recovered.

The "buggy bar" or "heal bar" is commonly referred to as a pry bar. This pry bar appears to be 16 to 18 inches in length and made from 5/8 or 3/4 quarter-inch-round stock with a rolled head and a shaft tapering to a point.

Reportedly, de-hosing of the shields means that the hydraulic lines between the adjacent shields are disconnected at the manifold and the lines are then placed behind the telescoping props or on the shield to prevent damage to them during the recovery. Normally, about 15 shields are de-hosed at a time.

Persons providing information during the accident investigation were not aware, with certainty, of any device on the shield to relieve pressure in the emulsion return line in the event that it became pressurized. Only one prior incident of not being able to remove the staple lock on the emulsion return line occurred, during the first longwall panel. Reportedly, a manufacturer representative attached a "come-along" device to the staple lock and then positioned himself a safe distance away from the connection when the staple lock was pulled out. Also, automatic pressure relief valves are attached to the emulsion return line at the tailgate and headgate area to discharge return line pressure, should it reach 25 bars or about 367.5 psi. Reportedly, the pressure relief valves have been activated previously due to restrictions in the return line outby the section. Also, the

pressure relief valves are moved when the furthest tailgate shield is recovered and when the headgate drives are moved.

It was not determined during this on-sight investigation as to when or how the plug was placed in the manifold emulsion return connection at Shield No. 1.

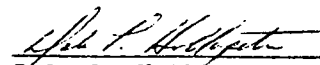
The Preshift-Mine Examiner's Report for September 20, 1989, 4th East Section, indicated that Leonard made the examination from about 5:30 to 5:56 a.m. The report was received outside the mine at 6 a.m.

CONCLUSION

During recovery of longwall shields in the 4th East Section the emulsion return line was plugged at the Shield No. 10 and 1 manifold, creating a closed fluid circuit. Through apparent activation of a "Piano-Key" control system lever on a shield, the emulsion fluid in the emulsion return line became pressurized to the same pressure as the emulsion fluid in the emulsion supply line, estimated to be in excess of 4000 psi. Attempts to relieve the pressure in the emulsion return line or to disconnect the emulsion return line had failed. As indicated, Paul D. Leonard, Longwall Production Foreman and victim, having knowledge of the emulsion fluid pressure in the emulsion return line, used a hacksaw to cut into the line. The sudden release of energy from the pressure within the emulsion return line apparently caused the emulsion return line to strike Leonard on the head with lethal force.

VIOLATIONS

There were no violation found which either caused or contributed to the accident.



Dale L. Hollöpeter
Coal Mine Safety and Health Inspector



John M. DeMichie
District Manager

APPENDIX

List of persons furnishing information or who were present during the investigation:

CYPRUS COAL COMPANY - OFFICIALS

John J. Spiecha	Vice President of Operations
John Caylor	Safety Manager

CYPRUS-PLATEAU MINING CORPORATION - OFFICIALS

George C. Trevorrow, Jr.	Vice President and General Manager
William E. Snyder	Manager of Operations
Ernal A. Shaw	Director of Safety
Steve Rigby	Underground Superintendent
Kerry Jensen	Longwall Coordinator
Rulon E. White	Shift Foreman
Max Davis	Maintenance Coordinator
Kelly B. Fausett	Maintenance Foreman
Richard Tucker	Safety Representative

CYPRUS-PLATEAU MINING CORPORATION - EMPLOYEES

David W. Dimick	Shearer Operator
Ernie M. Martinez	Shearer Operator
Henry G. Mills	Longwall Setup
Ricky Riche	Headgate Operator
David J. Spears	Tailgate Operator
Larry C. Swasey	Mechanic, Longwall
Roland Tallerico	Propman

APPENDIX (cont.)

INDUSTRIAL COMMISSION OF UTAH

Ron Parkin

State Mine Inspector

MINE SAFETY AND HEALTH ADMINISTRATION

Tony Gabossi

Supervisory Coal Mine Safety and
Health Inspector

Danny Bordea

Coal Mine Safety and Health
Inspector

Richard Bury

Coal Mine Safety and Health
Inspector

Dale L. Hollopeter

Coal Mine Safety and Health
Inspector

William M. Taylor

Coal Mine Safety and Health
Inspector



Section A--Victim Data

1. Name	2. Sex	3. Social Security Number
Paul D. Leonard	<input checked="" type="checkbox"/> Male <input type="checkbox"/> Female	-7912
4. Age	5. Job Classification	
41	Longwall Production Foreman	
6. Experience at this Classification		7. Total Mining Experience
About 5 years and 7 months		About 13 years and 11 months
8. What activity was being performed at time of accident?	9. Victim's Experience at this Activity	10. Was victim trained in this task?
Indication: Trying to relieve hydraulic pressure contained in an emulsion return line.	Unknown	Trained in longwall recovery - yes

Section B--Victim Data for Health and Safety Courses/Training Received (related to accident)	Date Received
11. Annual Refresher (UG)	12-15-88
12. New Task Training (shield hauler/puller; headgate operator; longwall Faceman ; jacksetter; shear/plow operator; tailgate operator; laborer)	01-08-88
13. New Task Training (section forman)	01-08-88
14. Longwall Move Meetings	08-29-89 and 09-06-89

Section C--Supervisor Data (supervisor of victim)

15. Name	16. Certified
Kerry Jensen	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
17. Experience as Supervisor	18. Total Mining Experience
About 15 years	About 18 years

Section D--Supervisor Data for Health and Safety Courses/Training Received (related to accident)	Date Received
19. Annual Refresher (UG)	12-15-88
20. New Task Training (shear operator; petito mule; timberman; shield hauler; tailgate operator; shield operator; headgate operator; general labor)	01-07-88
21. Longwall Move Meeting	08-29-89 and 09-06-89
22.	

23. When was the supervisor last present at accident scene prior to the accident? The afternoon of September 19, 1989	24. What did he do when he was there? Spoke to the oncoming afternoon shift Longwall Production Foreman about general conditions pertaining to recovery.
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25. When was he last in contact with the victim? Approximately 15-20 minutes prior to the accident (brief conversation over the Pager)	26. Did he issue instructions relative to the accident? No
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27. Was he aware of or did he express an awareness of any unsafe practice or condition?
 No. Reportedly, Paul D. Leonard, Victim, indicated the problem of having pressure on the return line and of his attempt to contact the pump room. Jensen expressed to Leonard, in part, that normally there should not be a great deal of pressure on the return line and to be very careful.



Section A—Information Required in Electrical Accident Reports

1. Voltage of Circuit Involved	2. Voltage to Which Victim was Exposed	
3. Type of Supply Circuitry (trolley wire, portable rectifier, wye connected secondary, delta connected secondary)		
4. Type, Size and Insulation Rating of Conductor Involved		
5. Electrical Protection for Circuit	6. Ground Fault Trip Value (3 phase only)	
7. Wiring Diagram of Circuit Involved (attach separate drawing)	8. Condition of Mine Floor	
9. Was victim wearing rubber boots? <input type="checkbox"/> Yes <input type="checkbox"/> No	9a. Condition of Boots	
10. Was victim wearing gloves? <input type="checkbox"/> Yes <input type="checkbox"/> No	10a. Type	10b. Condition
11. Type of Grounding for Equipment		

Section B—Information Required in Accidents Involving Equipment

12. Name of Manufacturer of Machine Involved Westfalia Lünen (Longwall Shield Support)		
13. Model, Approval Number and Type of Machine 2G-3535A (Longwall Mining Machine System)		
14. Machine Voltage 950 volts	15. Did design of machine contribute to accident? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
16. Did maintenance deficiencies contribute to accident? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	17. Name of official responsible for maintenance of equipment. Jerry Price, Master Mechanic	
18. Experience of Operator N/A		
19. Was machine being operated within safe limits of its capability? (if no, explain why) * <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		

Section C—Remarks

* The Longwall Shields Supports were being recovered from the 4th East Section and the disassembly of the Longwall Shields Supports System.