

REPORT OF MINE EXPLOSION  
SUNNYSIDE NO. 1 MINE, UTAH FUEL COMPANY  
SUNNYSIDE, CARBON COUNTY, UTAH  
May 9, 1945

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FINAL REPORT OF MINE EXPLOSION  
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By  
J. H. Bird and R. D. Reeder

INTRODUCTION

An explosion occurred at 3:12 p.m., May 9, 1945, in the Sunnyside No. 1 mine of the Utah Fuel Company, Sunnyside, Carbon County, Utah.

Eighty-five men were employed in the mine at the time of the explosion. Twenty-three were killed by violence, burns, and afterdamp, and seven were hospitalized; fifty-five escaped unassisted. The seriously injured employees were sent to the hospital at Dragerton and six of them recovered within a few days from the effects of the explosion.

As no damage was done to the ventilating fan or to the ventilating system outby the 2 dip section of the mine, the ventilation was soon restored in the affected area by men wearing oxygen breathing apparatus. Most of the bodies of the victims were recovered by noon of May 10, and the last body was recovered at 9:15 a.m. Friday, May 11.

The most likely cause of the explosion was the ignition of an accumulation of methane near the face of the 3 left back entry, a return air course, off 2 left, 2 dip, by some means which exhaustive investigation did not definitely reveal. A defective or a mishandled flame safety lamp may have been the cause of the ignition; however, matches and smoking material were found on two of the deceased employees, and a nonpermissible pump, equipped with an open switch, was installed near the origin of the explosion.

The Bureau of Mines at Salt Lake City, Utah, first learned of the explosion by a radio news broadcast at 10:30 p.m., May 9, 1945. J. Howard Bird, mining engineer, first called R. D. Reeder, acting supervising engineer, and then called Walter B. Odendahl and H. J. McCreary. These four Bureau of Mines employees left Salt Lake City at 11 p.m. and arrived at Sunnyside, Utah, at 4:20 a.m. Thursday, May 10. R. D. Reeder offered Mr. Claude P. Heiner, vice president of the company, and Mr. Stanley Harvey, chief coal-mine inspector of Utah, the assistance of the Bureau of Mines. He was informed that most of the bodies had been recovered, that ventilation had been restored in the affected area, and that recovery work was delayed to some extent because a fall of roof had to be moved in the 3 left back entry in order to recover several of the bodies. The Bureau representatives' entrance to the mine was delayed until 11 a.m. pending the arrival of rescue crew and company officials from nearby mines.

Mr. E. M. Royle, chairman of the Industrial Commission of Utah and supervisor of Labor Relations, Mr. R. H. Dalrymple, commissioner, Mine and Safety Inspection, and Mr. O. A. Wiesley, commissioner, Workmen's Compensation, arrived at the mine Thursday morning, May 10, and conferred with

Mr. Stanley Harvey, company officials, and with the Bureau of Mines representatives.

## GENERAL INFORMATION

### Location and Operating Officials

The Sunnyside No. 1 mine is at Sunnyside, Carbon County, Utah, about 26 miles southeast of Price, Utah. It is owned and operated by the Utah Fuel Company and is served by a branch line of the Denver and Rio Grande Western Railroad. A portion of some of the haulageways is on land leased from the Government, (Salt Lake 062966-063383); no coal was being extracted from the leased land at the time of the explosion. The officials of the company at the time of the explosion were:

Moroni Heiner	President	Salt Lake City, Utah
Claude P. Heiner	Vice President	Salt Lake City, Utah
Fritz Nyman	Gen'l. Supt.	Castlegate, Utah
Archie Morrison	Superintendent	Sunnyside, Utah
C. S. Westerberg	Project Manager	Sunnyside, Utah
Frank Markosek, Jr.	Mine Foreman	Sunnyside, Utah

The company also operates the following mines in Utah and Colorado:

Castlegate No. 2	Castlegate, Carbon County, Utah
Clear Creek No. 3	Clear Creek, Carbon County, Utah
Somerset (Calumet Fuel Co.)	Somerset, Gunnison County, Colo.
Calumet No. 2 (Calumet Fuel Co.)	Delcarbon, Huerfana County, Colo.

### Employment and Production

Two hundred and forty-nine persons were employed on 2 shifts at the mine, 165 working underground on 2 shifts. The tipple and the cleaning plant, constructed of steel and concrete and provided with modern equipment, is used for preparing coal from the Sunnyside No. 1 mine, and also from the Sunnyside No. 2 mine of the Kaiser Company, Inc. The average daily production of No. 1 mine approximated 1,500 tons, and the total production in 1944 was 379,372 tons of coal.

### Openings and Nature of Coal Bed

The mine is opened by four slopes; the main haulage slope, which is concrete-lined at the portal and is used for handling coal and material, is an intake airway; the manway slope, which parallels the main haulage slope; and the No. 2 raise entry, which was driven to the outcrop about 8,300 feet northwest of the main haulage slope, are also intake airways; the main return airway slope, which parallels the manway, is concreted for a distance of about 150 feet inby the fan.

The main haulage slope is about 1,200 feet long and dips about 15 percent. The mine is operating in the Lower Sunnyside coal bed, which ranges from 8 to 12 feet in thickness, contains several thin bands of bony coal, and dips in a northeasterly direction about 14 percent outby or west of the

fault and about 10 percent in by or east of the fault. Some of the mine workings have been driven through the Sunnyside fault, locally known as the "30-foot fault," which had a vertical displacement or upthrow of 20 feet in the 2 dip. The 3 left slant back entry (the explosion area) had been extended to the fault. The coal is of high-volatile bituminous rank and of good coking quality. The immediate roof consists of 8 to 22 inches of medium soft shale, and the main roof of sandstone. The floor consists of hard shale. The maximum cover over present workings is about 1,700 feet.

The analysis of the mine run coal as furnished by the company is as follows:

	Percent
Moisture .....	4.7
Volatile matter .....	37.3
Fixed carbon .....	52.1
Ash .....	5.9
Total .....	100.0

Bureau of Mines tests and experiments have shown that coal dust having a volatile matter to total combustible matter ratio in excess of 0.12 is explosive when in a dust cloud in the air, and that the explosibility of the coal dust increases as this ratio increases. The volatile ratio of the coal dust at this mine is 0.42.

## MINING METHODS, CONDITIONS, AND EQUIPMENT

### Methods of Mining

The room-and-pillar system of mining has been adopted in this mine. Rooms are driven on 50-foot centers and 26 feet wide, to the rise off the cross entries, usually after the entries have been driven their full distance. The pillars between rooms are recovered as soon as possible after the rooms are driven the required distance of about 350 feet. Cross entries are driven two, three, or four abreast, on centers of 80 feet and 14 feet wide, to the right and left off the inside slopes at intervals of 400 feet. Coal is undercut with shortwall mining machines or undercut and partly sheared with track-mounted cutting machines. Coal is loaded in cross entries and dip entries by means of track- or tractor-mounted loading machines and chain conveyors, and in rooms and raises by means of shaking conveyors.

The fault intersects the 2 dip slopes at a point about 230 feet below the 2 left main entry, and the position of that fault made it difficult to drive the 3 left entries from 2 dip as projected. Therefore, the 3 left entries were started as slants off the 2 left entries. From these slants the planned 3-entry system will be turned and driven clear of the faulted zone.

The above mentioned fault had been intersected in the driving of the 3 left back entry, and the course of the entry was in the process of being changed away from the fault.

### Ventilation and Gas

The mine is ventilated by means of a 7-1/2 foot centrifugal fan, which is operated exhausting and driven by a 60-horsepower 220-volt alternating-current motor. The fan with steel casing is offset about 25 feet from the portal of the return airway slope, and the fan housing is equipped with doors for reversing the direction of the air current. Also, a device to give warning, if the fan slows or stops, is provided at the fan. A total of 81,000 cubic feet of air a minute was being exhausted from the mine at a water-gauge pressure of 3.75 inches at the time of the second Federal reinspection (December 13-16, 1944).

The mine is rated gassy by the Safety Division of the Industrial Commission of Utah. Preshift examinations are made by a fire boss, and foremen make tests for gas several times during each shift with permissible type safety lamps.

The 2 left entries off 2 dip were idle for about 6 weeks prior to the date of the explosion, and it was reported that the faces of the 2 left entries were inspected once every 2 days. Methane gas had not been detected in those entries while they were being driven or since they were temporarily abandoned.

The mine ventilation was not disturbed as a result of the explosion, except in the 2 dip section; the ventilation in this section was soon restored with brattice-cloth-and-board stoppings by rescue crews equipped with oxygen breathing apparatus.

Prior to the explosion, the 3 left entries were ventilated by a split of air off the 2 left entries. An overcast was built at the intersection between the 2 left return air course and the 3 left main entry. A single door had been erected in the 3 left back entry between the 2 left haulage-way and return air course. The crosscuts between the 3 left main and back entries were closed with temporary brattice stoppings, and a drop curtain was built in the last crosscut to deflect the air along a line brattice to the face of the 3 left back entry. A line brattice was also built from the last crosscut to the face of the 3 left main entry.

Six air samples were collected. The results of the analyses and the locations where the samples were taken are shown in Table 1 of this report.

### Drainage

The main haulage roads are well drained, but pumps must be used to remove the water which accumulates at the faces of the slopes.

On May 6, prior to the explosion, a centrifugal pump direct-connected to an open-type induction motor was installed in advance of the last crosscut and on the return side of the line brattice leading to the face of the 3 left back entry. The 220-volt alternating current for operating the pump motor was controlled by a push button and an "across-the-line" starter which was enclosed in a metal case.

Table 1  
Analyses of Air Samples

Bottle No.	Location	Percent					Cu. ft. air a minute	Cu. ft. methane 24 hrs.
		CO <sub>2</sub>	O <sub>2</sub>	CO	CH <sub>4</sub>	N <sub>2</sub>		
843-I .....	Fan exhaust, 5 a.m. 5/10/45.	0.17	20.47	0.06	0.16	79.14	92,763	213,725
842-I .....	Fan exhaust, 5:05 a.m. 5/10/45.	0.18	20.45	0.06	0.15	79.16		
835-N .....	50' outby face 3 L. back entry near pump and foeder, 11:40 a.m. 5/10/45.	0.10	20.84		0.27	78.79	*	
834-D .....	3 L. main entry at cutting machine; return from main and back entries, 11:45 a.m. 5/10/45.	0.12	20.31		2.06	77.51	*	
885-P .....	Face 3 L. main entry at loading machine 2 p.m. 5/11/45	0.07	20.75	**	0.25	78.93	*	
886-U .....	At locomotive in 2 L. main entry off 2 dip, 2:55 p.m., 5/11/45.	0.14	20.53	**	0.31	79.02	*	

\*Not perceptible

\*\*Possible trace, less than 0.005

The pump was operated to clear the working place of water to permit cutting, drilling, and blasting. However, testimony revealed that it was not necessary to operate the pump continuously, as the loading machine cleared the place of water when coal was being loaded.

#### Dust

At the time of the second Federal reinspection (December 13-16, 1944), the mine was slightly damp, and water was piped to all working places. It was generally being used to allay the coal dust at its source during the mining operations of cutting, loading, and blasting. Loaded trips were also sprayed at different places enroute to the main haulage slope.

The mine was well rock-dusted at the time of the reinspection, but the rock dust had not been extended to within 40 feet of the faces of some entries. Rock dust is applied by hand or by a high-pressure rock-dusting machine. The 3' left entries were rock-dusted on May 6 by the night shift using the rock-dusting machine.

Four samples of dust were collected in the affected area during the investigation and were sent to Pittsburgh for analysis. The results are shown in table 2.



Table 2  
Analyses of Dust Samples

Can No.	Location	Kind of Sample	Percent			Remarks
			Combustible VM+FC	Incombustible +ash	Through 20 mesh	
L-406	2 dip at I L. back entry.	Rib-roof	16.7	83.3	63.4	Explosion area rock-dusted.
B-561	No. 1 slope 2 dip 40' above machine shop crosscut	"	68.1	31.9	99.4	Rock-dusted.
F-570	3 L. back entry near pump	"	65.2	34.8	39.2	Rock-dusted May 6.
B-837	2 L. 2 dip near locomotive.	"	56.8	43.2	84.4	Rock-dusted.
Alcohol Coke Test						
Can No.	Coked Particles Present		Can No.	Coked Particles Present		
L-406	None		F-570	Small amount		
B-561	Trace		B-837	" "		

It will be noted that only one of the samples contained more than the recommended 65 percent incombustible to make the dust inert, and the rest of the samples contained sufficient coal dust to be explosive, yet there were only small amounts of coke particles in any of the samples. The presence of a small amount of coke and the damage done to stoppings and overcasts within a limited area indicate that the explosion was propagated to some extent by coal dust. In view of the generally good rock-dusting practice, the large amount of combustible in three of the four dust samples collected from rib and roof surfaces probably is due to coal dust from face regions and coal dust produced from the mine surfaces by the forces of the explosion and widely distributed by outward and inward rushes of heated gases.

#### Haulage

Trolley-pole locomotives are used for main line haulage, and cable-reel locomotives are used for gathering purposes. A storage-battery locomotive is used for miscellaneous haulage. Trips on the main haulage slope and on 1 and 2 dips are handled by means of electrically operated hoists. The 5-ton all-steel mine cars are equipped with brakes and swivel couplings.

The underground haulage tracks were maintained in fair condition. Adequate clearance has not been provided throughout the mine, and shelter holes have not been provided at regular intervals. The haulage roads are on intake air except in 3 left slant entries.

#### Lighting

Underground employees are provided with permissible electric cap lamps. At the time of the second Federal reinspection, electric trip lights were not being used on trips and only a few electric lights were installed along the haulage road.

## Machinery and Electricity Underground

With the exception of the pump motors, the underground electrical machines used in the face regions are of permissible type and are operated by 220-volt alternating current. The locomotives are operated on 550-volt direct current. The trailing cables of the cutting and loading machines and pumps are connected to the rubber-covered cables by means of 3-pole rubber-covered separable pin-plug connectors (Miller type). Alternating current at 4,000 volts is transmitted underground through an armored cable, which extends along the main haulageway to the motor generator and to the transformers. The generator is enclosed in a fireproof room adjoining the main haulage road.

Oil-cooled transformers are installed in large, closed, metal boxes mounted on mine-car trucks; also, the transformer cases are grounded. Sectionalizing switches are provided along the high and low voltage power cables, and cut-out switches are provided on the trolley wire at 1,000- to 2,000-foot intervals. Generally the rails are well bonded throughout the mine, but bonding or cross bonding of the rails had not been done in the 3 left back entry, as the haulage in that entry was only temporary.

## Timbering

By leaving 2 to 4 feet of roof coal, much of the trouble experienced with the overlying fragile shale has been overcome. According to the company's timbering rules, cross bars are to be set on 6-foot centers in all entries, or closer if required. It was stated that in the 3 left entries where the explosion occurred, cross bars were set on 5-foot centers, although practically all of the timbers there were dislodged by the force of the explosion, as were the timbers near the face of the 2 left haulage road.

## Explosives and Blasting

Sheathed permissible explosives and No. 6 electric detonators with 10-foot leg wires are used for blasting the coal. The blasting cables are more than 100 feet long. The boreholes are drilled with permissible, post-mounted drills, or with permissible drills attached on track-mounted cutting machines. The boreholes are stemmed to the collar with incombustible material, and the shots are fired during the shift with nonpermissible blasting units.

Explosives in their original containers are placed in wooden boxes, loaded into the regular steel mine cars, and transported underground during the day shift. The explosives and the detonators are stored underground in separate wooden storage boxes, which are provided in the different sections of the mine.

## General Underground

Smoking is forbidden underground, but employees are not searched at regular intervals before entering the mine. It was reported that the last search for smokers' articles was made about 6 months prior to the explosion.

### Protective Clothing

Underground employees wear protective hats and safety-toe shoes.

### First Aid and Mine Rescue

Thirteen employees received initial first-aid training and 49 received additional first-aid training in 1942, but none has been trained since that time. None of the employees has received mine rescue training since October 1938. Mine rescue equipment is not on hand at this mine but is available at the adjoining Sunnyside No. 2 (Kaiser) mine, also at the company's mine at Castlegate, Utah, and at other nearby mines.

### Safety Organizations

A safety organization of employees and officials has not been established, and safety meetings have not been held. A bulletin board has not been provided for displaying safety posters.

### Supervision and Discipline

Prior to the explosion, coal was being mined in the raise between 2 left and 1 left, 2 dip; in the 3 left slant entries off 2 left, 2 dip; in 4 left entries, 2 dip; in 1 right, 2 dip; and in the rooms off 1 left entry, 1 dip. A maximum of 20 men is supervised by 1 face boss. The face bosses visit each working place at least 4 times each shift. Face bosses are not required to perform any work other than their supervisory duties.

### Underground Fire Prevention

Water lines have been laid along the haulageways throughout the mine, and water taps have been provided at regular intervals. An adequate supply of water is available. Fire hose or fire extinguishers are not provided, but a supply of rock dust is available near some of the stationary machinery. An adequate supply of brattice cloth is available at all times.

### PREVIOUS EXPLOSIONS IN THIS AND NEARBY MINES

Previous explosions or serious fires, in which heavy loss of life was involved, have not occurred at this mine. A local dust explosion on March 14, 1945, in the Kenilworth mine, operated in the same coal field by the Independent Coal & Coke Company at Kenilworth, Carbon County, Utah, caused the death of 7 men. An explosion in the Standard mine of the Standard Coal Company in February 1930 caused the death of 23 men. An explosion on March 8, 1924, in the Castlegate mine, operated in the same coal field by the Utah Fuel Company at Castlegate, Carbon County, Utah, caused the death of 171 men. Five men were killed in an explosion in the Rains mine of the Carbon Fuel Company on September 21, 1924.

### MINE CONDITIONS PRIOR TO THE DISASTER

The weather for 24 hours prior to the explosion was fair, and the mine had been operated normally except that the night shift on May 8 had not worked because of the announcement of "V-E Day."

The presence of gas had been reported in the 3 left back entry on April 4, 6, 8, 9, 10, 13, 18, 27, 30, and on May 2. Mr. F. Markosek, Sr., the fire boss, detected gas in 3 left back entry on May 9, as his report for that day reads as follows:

I found small quantity of methane 3rd. left back entry 2d. dip. Place cleared out and safe 8:00 a.m. - F. Markosek.

According to testimony at the hearing on May 17 at Sunnyside, Utah, conducted by the Industrial Commission of Utah, the face boss detected a small body of gas in a depression in the roof over the right rib in 3 left back entry, where a fault had been intersected some time before. A gas feeder was known to exist at that point. A line brattice had been erected from the last crosscut to the face, and a "wing" brattice was erected on the return side of the line brattice so the air would be deflected to the feeder. In addition, it was stated that a deflector was built to force the air vertically into the depression in the roof.

After the small pocket of gas had been cleared, the fire boss left the mine, but returned later with men and material to erect a line brattice in the 3 left main entry where the mine track had been extended into the face from the last crosscut. After the track had been laid to the face of the 3 left main entry, 75 feet of the line brattice had to be moved away from the track and closer to the rib. The line brattices in both the main and back entries of 3 left were within 20 feet of the faces, and the fire boss reported that gas was not detected in the 3 left main entry although a strong feeder was noted in the floor near the face by the investigators after the explosion.

When the fire boss re-entered that section of the mine, accompanied by the brattice crew, he found the curtain in the last crosscut fastened up, thus short-circuiting the flow of air to the face of the 3 left back entry. He corrected the condition and warned the workmen in that area of the danger of fastening up the curtain.

The fire boss completed the line brattice at about 11 a.m. and, as he prepared to leave the area, he again found the above mentioned curtain fastened up. It was stated that he cautioned the face boss, the locomotive crew, and also the machine crew, who were cutting and drilling in the face of the back entry, regarding the curtain.

Mr. F. Markosek, Jr., the mine foreman, stated that he visited the area on Wednesday morning, May 9, after receiving the fire boss's report of the presence of methane. He stated that the working places were clear of gas and that there was enough air circulating to ventilate the faces properly. However, the amount of air circulating through the 3rd left entries, particularly the advancing faces, was evidently insufficient inasmuch as a gas accumulation and probably an ignition occurred. All the air measurements for the preceding month and up to the time of the explosion were recorded in a book which was kept by the safety and ventilation engineer. This book was completely destroyed by the explosion.

Mr. Archie Morrison, the mine superintendent, stated that he also visited the 3 left entries on Wednesday morning, May 9, and reported that he found no methane and that he judged there was sufficient air circulating to the faces for proper ventilation. He stated also that when he left the 3 left entries between 11:30 a.m. and noon, the cutting machine was in the face of the back entry, that the pump had just been shut down, and that he found no other unusual condition.

Mr. M. H. Bradak, the safety and ventilation engineer, had been engaged in measuring air throughout the mine on May 9, and it was reported that at 2:30 p.m. (42 minutes before the explosion) he went from 1 left, 1 dip, to measure the air in the 3 left, 2 dip, the last places on his scheduled round. His body, location No. 30 on the map appended hereto, was found near the pump in the 3 left back entry.

Testimony revealed that during a conference with the face boss in 1 left, 1 dip, Mr. Bradak had found more air than was necessary (12,000 cubic feet of air a minute) circulating in that section, and that he intended to divert about 5,000 cubic feet of air a minute from the 1 left, 1 dip to the 2 dip area to supplement the amounts then circulating in the 2 left and 3 left entries, 2 dip.

Mr. Bradak had left his flame safety lamp at the hoist at the top of 1 dip. Before leaving the 1 left, 1 dip, he stated that he would not have enough time to return for his flame safety lamp, and that, if necessary, he would borrow a lamp to use in the 3 left entries. The lamp with "M. Bradak" inscribed on the bowl was found after the explosion at the above mentioned hoist.

The following list shows the number of men in the mine at the time of the explosion and where they were working.

<u>District</u>	<u>No. Men</u>	<u>Dead</u>	<u>Injured</u>	<u>Escaped</u>
3 left and 2 left, 2 dip .....	17	17	-	-
1 right, 2 dip .....	11	4	7	-
Top of cave in 2 dip below 2 left ....	2	2	-	-
2 main dip .....	9	-	-	9
4 left, 2 dip .....	14	-	-	14
1 left, 2 dip .....	3	-	-	3
1 left, 2 raise .....	7	-	-	7
1 left, 1 dip .....	7	-	-	7
New Motor road .....	8	-	-	8
Other general (supervisors, motor, hoistmen) .....	7	-	-	7
Totals .....	85	23	7	55

#### STORY OF THE EXPLOSION AND RECOVERY OPERATIONS

The day shift employees in most of the mine were preparing to leave their assigned posts at the end of the shift. Usually a man-trip is operated between the 1 right, 2 dip parting and the active workings in 1 right, but the locomotive had failed, and the men had to walk to 2 dip. The 11 men in that section were at various points along the haulageway, and at least 2 men - the motorman and the trip rider - were at the parting,

supposedly attempting to repair the locomotive. The others were at or near the parting when a light concussion was felt, which was followed immediately by a heavy rush of air and dense dust. The men were apparently aware that an explosion had occurred and, in confused order, attempted to escape from that section by walking up the back or No. 1 slope of 2 dip.

According to testimony at the Industrial Commission hearing, the mine foreman was on the main haulageway at 1 dip when he felt a heavy concussion from inby that point. He telephoned to the surface, reporting that he suspected an explosion had occurred; he then threw the master switches (circuit breakers) located near the 1 dip hoist, cutting off electric power to the 1 dip and 2 dip sections, after which he proceeded to 2 dip in company with the motorman. He travelled alone down the 2 dip to the 1 right parting. Travel was difficult because of the smoke and dust; and, not having respiratory protection, he was somewhat affected by the afterdamp. It was apparent to the mine foreman that a number of the men he examined at and near the parting were alive, and after turning some of the men over and cleaning dirt from their faces, he returned up 2 dip to the haulageway for assistance. After hastily organizing a small rescue crew, the mine foreman led the rescuers down the dip to the 1 right parting. The atmosphere had improved considerably as the operation of the fan had not been interrupted. Although some smoke remained, the members of the rescue crew were affected only slightly by the gases and were able to revive, by first-aid treatment, 7 of the 11 men grouped near the parting and a short distance up the No. 1 slope of 2 dip. The injured persons were soon removed to the surface and hospitalized. Six of them were in the hospital only a short time, as their injuries consisted mostly of carbon monoxide poisoning. The bodies of the 4 victims in that section were removed on a subsequent trip; the mortician reported that death was due to carbon monoxide poisoning. It was assumed that those 4 men were not directly exposed to flame, as their bodies were not burned.

The 55 men who were working in other sections of the mine, remote from the explosion area, reached the surface without assistance. Some of the men who were leaving 4 left, 2 dip suffered some discomfort from dust and smoke, and 2 men from that section who had reached the No. 4 slope, 2 dip received slight burns about the face and hands.

While the bodies and injured men were being rescued from the 1 right parting, the superintendent notified other company officials, summoned rescue crews from nearby mines, and notified the chief coal-mine inspector. Rescue crews equipped with oxygen breathing apparatus responded as follows: Kaiser Co., Incorporated, Sunnyside, Utah; Geneva Steel Co., Horse Canyon mine, Dragerton, Utah (two teams); Columbia Steel Co., Columbia, Utah; Utah Fuel Co., Castlegate, Utah; Independent Coal and Coke Co., Kenilworth, Utah (two teams).

Mr. Stanley Harvey, chief coal-mine inspector of Utah, who was returning home from inspecting a mine nearby, arrived at the mine at 4:25 p.m. on May 9 and organized and directed the rescue and recovery work.

Prior to the explosion, the 2 left and 3 left entries were ventilated by separate splits of air from 2 dip. Overcasts had been established at

the intersection of 2 left haulageway and the 2 dip return air course and at the intersection of 2 left return air course and the 3 left main entry. A single door had been built in 3 left back entry near the 2 left haulageway or intake airway.

The stoppings and overcasts in the immediate area were destroyed by the explosion, thus disrupting the regular ventilation; and in order to expedite the rescue work, brattice-cloth stoppings were built to establish ventilation in the 3 left entries direct from the 2 dip, thus reversing the former direction of the ventilating current.

The rescue crews, working in shifts, located and removed six bodies in the 3 left back entry near the second crosscut; two bodies were found in the 2 dip opposite 1 left, 1 dip; the body of M. H. Bradak, the ventilation and safety engineer, was found in the 3 left back entry, about 70 feet in by the last crosscut; four bodies, the cutting-machine crew and the motorman and his helper, were found near a cable-reel locomotive in the 2 left haulageway about 580 feet in by 3 left; the body of James Jardine, the 3 left face boss, was found on the 2 left haulageway at the intersection of the 3 left back entry; four bodies were found near and under a large fall in 3 left back entry between the second and third crosscuts; the last body recovered, that of Bud Walton, a mason, was found in the first slant off the 2 left haulageway.

All bodies rescued from the 2 and 3 left entries, except those near the locomotive in 2 left, showed evidence of exposure to heat and violence; Bradak's body was unclothed and had been exposed to intense heat and violence. The bodies of James Jardine and Bud Walton were mutilated, as a result of considerable violence. The bodies of the cutting-machine crew and the motorman and helper in 2 left were burned about the face and hands, but they had not suffered from violence.

A small coin purse containing seven unlighted matches and a packet containing an unlighted cigarette were found on the body of a machine runner's helper recovered in 3 left back entry, and two unlighted cigarettes were found near the body. Also two unburned matches were found in the clothing of a trackman nearby. The bodies were found about 300 feet out by the last crosscut. However, no burned matches or cigarettes were found in the immediate area. The violence in that area caused several roof falls; therefore, it would be difficult to find burned matches or cigarettes.

As stated before, representatives of the U. S. Bureau of Mines, R. D. Reeder, J. Howard Bird, W. B. Odendahl, and H. J. McCreary, arrived at the mine at 4:20 a.m. May 10 and immediately received a report of the progress of the rescue work from the mine officials and from Mr. Harvey, who reported that the ventilation had been restored and that most of the bodies had been recovered. There were four men still not located and rescuers working in fresh air were exploring the debris in a fall in the 3 left back entry, from which three bodies were recovered later.

At 10 p.m. May 10 the rescue work was halted to afford a rest period for the rescuers and particularly for the persons directing the work. A crew entered the mine about 6 a.m. May 11 to find the last body which was found isolated in the slant off 2 left.

## INVESTIGATION OF CAUSE OF EXPLOSION

Exploratory trips were made on May 10 through the affected area by representatives of the Utah Fuel Co., the Safety Division of the Industrial Commission of Utah, and the U. S. Bureau of Mines, after which Messrs. Reeder, Odehdahl, and McCreary returned to Salt Lake City. A similar trip was made on May 11 by various company and State officials, and an official inspection was made on May 12 to observe conditions and to obtain facts regarding the explosion. The committee consisted of the following persons: Messrs. William R. Cox, local president, Albert Roberts, financial secretary, Elmer Brinely and Alex Romero, safety committee members, all representing Local No. 6244, United Mine Workers of America; Messrs. S. C. Harvey and R. J. Schultz, representing the Safety Division of the Industrial Commission of Utah; Messrs. James Thorpe, superintendent of the Castlegate mine, and Archie Morrison, superintendent of the Sunnyside No. 1 mine, representing the Utah Fuel Co.; Mr. J. Howard Bird, representing the U. S. Bureau of Mines. Also, a number of other company, union and State officials accompanied the party as unofficial observers.

A committee meeting was not held after the inspection; therefore, a decision was not rendered naming the direct cause. The union representatives made an independent report, and an oral report was made by the company representatives. All seemed of the opinion that a body of gas had been ignited in the face of one of the 3 left entries, most probably the back entry, but that the direct source of ignition could not be definitely determined. Copies of the reports which were issued are appended.

### Detail and Summary of Evidence

As stated before, the mine superintendent left 3 left entries about noon on May 9, at which time the cutting-and-drilling crew were preparing the face of the 3 left back entry for blasting, and the pump had been shut down. He stated also that the face was to be blasted some time after lunch. At the time of the investigation, it was noted that the previously mentioned face had been blasted, apparently some time before the explosion. The shot-firing unit could not be found, but the blasting cable was lying in a coil near the rib outby the last crosscut. Moreover, the face boss, who was the only certified person in that section authorized to fire shots, was found in the 2 left main entry. It should be noted here that Mr. Brakak, ventilation and safety engineer, who was found near the face of the 3 left back entry where the explosion originated, was certified, but it was not his duty to fire shots.

The overcasts over the 2 left, 2 dip motor road and over the 3 left, 2 dip motor road were destroyed. There were four stoppings destroyed in the 2 dip; three of these were near the 2 left entries and one opposite the 1 left, 1 dip entry. One stopping near the inby end of the parting in 1 right, 2 dip was blown out by the force, and as far as could be determined all stoppings in 2 left, 2 dip were destroyed. The force of the explosion dislodged many timbers in 2 left, resulting in a fall of roof for several hundred feet out from the face, so when the face of that entry was examined it was impossible to reach some of the stoppings along the entry. The 2 left return air course could not be traveled the entire distance because of accumulations of water.



The primary switch, a hand-operated oil circuit breaker, controlling the alternating current in 2 and 3 left entries, was mounted on the side of the overcast near the rib at the No. 3 slope of 2 dip. It was in the "off" position after the explosion and had not been noticeably damaged by the force of the explosion. The recess in the wall of the overcast where the switch was installed was intact, but the rest of the overcast was demolished. The force of the explosion could have opened the switch, or it may have been opened before the explosion. Conditions found after the explosion showed that much, if not all, of the electrical equipment in 3 left entries was idle before the explosion, possibly because of a general order of the face boss.

The 4,000-volt alternating current was transmitted through armored cable from the oil switch to a portable transformer in the 3 left main entry at the second crosscut, and the switch controlling the 220-volt alternating current beyond the transformer was found in the "on" position. The superintendent stated that face bosses and other officials were instructed not to use the switch at the transformer and that when it was necessary to cut off the power to a particular area the sectionalizing or primary switches were to be thrown.

The permissible-type universal cutting machine was at the face of the entry being turned off the 3 left main entry, which will be the top entry of the 3-entry system. The face had been undercut and partly sheared, and the cutter bar was left in the shear cut. The soot at this face and at the edges of the shear cut and the small layer of coke on the coal dust adhering to the ledges on the lower rib indicate the presence of some flame in that area. Since the face had been cut and partly sheared, it is believed that the machine was in a position for drilling the boreholes. Sufficient drills were available near the machine for drilling the boreholes before the end of the shift. An extinguished flame safety lamp, intact and undamaged, was found on the floor near the cutting machine. This safety lamp was in satisfactory condition.

A close examination could not be made of the cutting machine, although it was noted that at least one bolt was missing from the motor casing, indicating it had not been maintained in a permissible condition. The controls are of a spring type and naturally were found "off." The three-conductor rubber-covered secondary power cable from the machine direct to the transformer was intact; the Miller plug a short distance from the mining machine was found disconnected and the cable partly reeled up after the explosion. The regular machineman and an extra regular machineman from another section were each assigned a flame safety lamp; these men and the regular helper comprised the cutting machine crew on May 9. It is believed that one of the lamps assigned to the machinemen was borrowed by Mr. Bradak and also believed to be the one found in 3 left back entry after the explosion.

The bodies of the two cutting-machine operators were found near a locomotive and one car, together with the bodies of the motorman and his helper, in 2 left main haulageway about 580 feet in by the 3 left entries. The locomotive-trolley pole was down and the trailing cable wound on the reel.

The traveling control was in neutral position, the power control was in "off" position, and the hand brake partly set. Three lunch buckets were found on the locomotive and another was found on the floor nearby.

In view of the fact that the cutting-machine crew had left their machine before the drilling had been completed, it would suggest that they may have been ordered to discontinue their usual work. The position of the cutter bar did not indicate the intention to leave the drilling for the following shift, for in that case the cutter bar should have been withdrawn. Officials advised that because of difficulties experienced from frequent "bumps" the cutter bars are not ordinarily left in the cut or shear at the end of the shift.

Gas was being liberated from the floor of 3 left main entry, about 10 feet from the face. On the day after the explosion, a small percentage of methane was detected near that face by means of an electric methane detector, but methane was not detected at a later date although the gas feeder was still active.

The Goodman No. 360 permissible-type track-mounted loader and three empty mine cars in the face of the 3 left main entry had not been disturbed. There was some indication of flame on the timbers left standing along the right rib, but those along the left rib showed no evidence of fire.

The control switch on the loader was in the "off" position, and the unit appeared to be in operating condition. The Miller plug near the machine was disconnected and the cable had been ruptured where it passed through the last crosscut. To facilitate the operation of the machine after it was received from the manufacturer, part of the control equipment had been moved from the left side and mounted on the right side. The change necessitated extending a rubber-covered cable under the elevator conveyor, and it was noted that in the side movement of the conveyor the insulation had been worn, exposing one of the wires; however, there was no evidence of arcing at that point. The change from the original design would void the permissibility of the unit.

About three cars of coal remained in 3 left main entry to be loaded, and this coal could have been loaded in a short time. Since the bodies of the motorman and his helper and the cable-reel locomotive, being used in 3 left entries, were found in 2 left entry, it is evident that the loader also had been idle for some time prior to the explosion, probably in compliance with official orders.

There was evidence of intense heat and some violence in the 3 left back entry from the last crosscut to the face. The unclothed and badly burned body of Mr. Bradak was about midway between the last crosscut and the face, and the position of his body, like others in the area, would not indicate accurately his location when the explosion was initiated. Some of the timber near the face had been moved 8 inches or more toward the face, as indicated on the cap pieces.

The pump which had been installed 18 feet outby a gas feeder was intact, except that the cover on the contact switch was off and the side of the switch box, outby the face, was slightly battered. Parts of the switch mechanism were damaged and the push buttons were broken. The entire switch and pump had been exposed to intense heat. The valve in the discharge line from the pump was closed. The discharge valve was always closed as soon as the pump was stopped, so the water trapped in the line could be used to prime the pump.

Two hundred and twenty volt alternating current had been transmitted to the pump motor through a triplex, rubber-covered cable. The Miller plug about 18 inches from the push-button switch was disconnected. It was noted that the outside rubber covering of the plug was burned, but the inside surfaces of the plug, which would ordinarily be protected when the plugs were joined, were not burned. The cable, with one section of the plug attached, had been thrown about 35 feet outby the face and had been torn from the main cable at the splice, but there was no indication of arcing.

The main cable, which extended from the 3 left back entry through the last crosscut to the loader, had also been torn apart at a splice, but there was no indication of arcing at that point.

The 10 bodies found in the 3 left back entry between the first and third crosscuts were burned and some were mutilated. Four of the bodies were found near or under a large fall between the second and third crosscuts. The other 6 bodies were found near a car of sand at the second crosscut. According to the mine foreman, the car of sand was near the original position where it had been left in preparation for building permanent stoppings in the three crosscuts to replace the brattice-cloth stoppings.

It should be noted that no bodies were found in the 3 left main entry, where, during normal operations, the loading and cutting machine would be operating.

The bodies of two timbermen were found in the 2 dip main slope at a point opposite the 1 left, 1 dip. These men were setting timbers where a fall had occurred. The men were burned about the face and hands, but it is believed that their death was due mostly to afterdamp.

According to the testimony of two witnesses at the hearing of the Industrial Commission a fuel vessel from a Koehler flame safety lamp, with some other parts attached, was found in the 3 left back entry near the last crosscut and a damaged bonnet was found nearby. The finding of this lamp and other lamps was also detailed to the writers. This lamp was not available as evidence and as far as the writers know could not be located at the time of the hearing; a lamp, however, issued on the morning of the explosion is not accounted for. Mr. Bradak's clothing and the cover of a notebook, supposedly his notebook, were found near the last crosscut. His anemometer, which was found near his body, was damaged.

A fuel vessel and part of a bonnet of a damaged flame safety lamp were found in the 2 left haulageway near the body of Mr. James Jardine. The fuel vessel of that lamp was forwarded to the Pittsburgh station of the Bureau of Mines for examination. At first it was suspected that the lock may have been faulty, but examination proved that to be incorrect. Since the lamp was incomplete as to gauzes and other protective features upon which the safety of the lamp would depend, it was not possible to make any tests that would show definitely whether that lamp could have been the source of an ignition. However, it was found at a point remote from the suspected point of origin of the explosion.

The force of the explosion damaged the explosive-storage boxes in the 2 left back entry, and an estimated one case of sheathed explosives and some detonators were strewn for a short distance along the entry.

#### Forces

There were indications that the force was in the direction away from the face of the 3 left back entry, except that in by the last crosscut the force was toward the face. Some timbers there were offset toward the face, and debris, including brattice cloth, had been thrown against the face.

#### Evidence of Heat and Flame

Flame extended through the workings in various directions from the 3 left back entry up to a distance of about 1,800 feet. Soot and dust were noticeable in the 3 left entries, and evidence of flame was noticed in the 2 left return air course, and along 2 dip in both directions from the intersection of the 2 left entries. There was little evidence of flame but there was a noticeable deposit of soot at the parting of the 1 right.

The deposits of coke were light throughout the area, and probably the recent rock-dusting in the 3 left entries minimized the amount of coal dust that entered into the explosion.

#### Point of Origin

As stated, the investigating committee did not arrive at a conclusion as to the source of ignition; however, it was generally agreed that a standing body of gas in the 3 left back entry propagated the explosion.

As previously stated the alternating current to the various electrical equipment in the 3 left entries may have been cut off prior to the explosion. This theory is supported by the fact that both the cutting and loading machines were idle, as the bodies of the operators were found some distance from their machines. It is evident that these machines were idle for some time, as the locomotive crew, serving the loading machine, and the cutting machine operators had been away from the section long enough to travel into 2 left. Available information indicates that these four men went into 2 left entry either to remove some rails or to gather some extra timbers. As there was no urgent need for such material, it appears that they were assigned the unusual work because of some difficulty in the 3 left entries.

Unless some unfavorable condition prevented further operation of the machinery in the 3 left main entry, it would be logical for the loading crew to load out the coal at the face of the entry and for the cutting-machine crew to prepare the face of the 3 left top entry for blasting.

Factual evidence neither proves nor disproves that the power to the pump in the 3 left back entry was on, or that the pump was operating at the time of the explosion. All haulage from the faces of the 3 left entries had been through the back entry to 2 left, and during haulage from 3 left entry the trailing cable of the gathering locomotive was hooked to the trolley wire in 2 left. On each trip to the face of the 3 left main entry, the locomotive and cars passed under the curtain in the last crosscut between the 3 left main and 3 left back entries. The mine track and the trolley wire had been extended from the 2 left haulage-way part way down 3 left main entry, where the haulageway was to be established in intake air, but that track was not being used prior to the explosion. There were no fires after the explosion and no evidence that the trolley wire in either the 2 or 3 left had fallen and caused arcing.

According to testimony, parts of a flame safety lamp were found in 3 left back entry just outby the last crosscut, and smokers' materials were found in the same entry about 300 feet outby the last crosscut.

The most likely point of origin was in the 3 left back entry at or near the last crosscut.

#### Source of Gas

There were known feeders of gas not far from the face of the 3 left main and back entries, and probably a large volume of gas was liberated in the 3 left back entry after the face was blasted, early that afternoon. Effective ventilation, regardless of the volume, could not be maintained at the face of 3 left back entry unless the door in 2 left was kept closed, the temporary brattice-cloth curtains in the crosscuts in 3 left entries were maintained as nearly airtight as possible (preferably permanent stoppings should have been built as the entries were advanced), and the check curtain in the last crosscut was kept down. The fire boss reported finding the curtain in the last crosscut pinned up twice during the morning; therefore, it may have been pinned up in the afternoon, as all important operations in the late afternoon were in the 3 left main entry. It is evident that the ventilation in 3 left back entry was not watched closely.

#### Probable Cause of the Explosion in the Opinion of the Bureau of Mines Investigators

It is the opinion of the Bureau of Mines investigators that a body of methane which accumulated in the 3 left back entry was ignited by a defective or improperly used flame safety lamp or by an arc from the nonpermissible electrical equipment at the pump. However, smoking or the lighting of a match were other possible sources of ignition.

It is probable that the explosion was caused by ignition of methane and extended or propagated by methane and coal dust raised into the air. It is also probable that rock dust that had been applied 4 days previously localized the explosion.

Lessons to be Learned From the Conditions  
as They Relate to the Explosion

1. Positive means of ventilation should be established at all faces, and a sufficient quantity of air should be circulated to dilute and carry away harmful gases.

2. When it is necessary to use doors for directing air currents, they should be erected in pairs. Doors and check curtains should be closed immediately after equipment or men pass through them.

The mine management has responsibility for providing, inspecting, and maintaining adequate ventilation in all working places underground and the employees have equal responsibility not to disturb or destroy the established ventilation by changing the normal position of doors, curtains, or other installations without orders to do so.

3. On branch haulageways, stoppings should be as nearly airtight as possible and constructed of substantial incombustible or fire-resistant material, except that one temporary stopping of wood or brattice cloth may be erected between the last permanent stopping and the last crosscut,

4. Face bosses or other authorized persons should make frequent tests for methane in all faces where that gas is known to be liberated, and when a dangerous amount of methane is detected, operations should cease in the affected area until the methane has been removed. Removal of a dangerous amount of methane should be attempted only when the mine is idle and with no men in the mine other than those engaged in changing the ventilation.

5. Flame safety lamps should be maintained in a permissible condition by a competent person and should be checked by each person using them.

6. Haulageways in gassy mines in which trolley or cable-reel locomotives are used should be ventilated by intake air.

7. Matches or smokers' materials should not be taken into the mine. All persons entering the mine should be searched at frequent, irregular intervals.

8. Nonpermissible equipment should be used only where an ample volume of intake air is in circulation.

9. Mining operations in or near faults are likely to involve increased dangers of liberation of quantities of methane or other gases.

RECOMMENDATIONS

The following recommendations are made in the belief that their adoption will lessen chances of a future disaster of this nature at this mine. Only recommendations that apply directly to the explosion are being made in this report because the mine was reinspected in December 1944 by a Federal coal-mine inspector.

## Ventilation and Gas

1. The quantity of air reaching the last open crosscut on any pair of working entries should be at least 6,000 cubic feet a minute.

2. Haulageways using electrical equipment of the trolley or cable-reel type should be ventilated by intake air, and the rails should be effectively bonded at every joint and cross-bonded at least every 200 feet.

3. Along branch haulageways, stoppings in crosscuts should be as nearly airtight as possible and constructed of substantial incombustible material, except that one temporary stopping of wood or brattice cloth may be erected between the last permanent stopping and the last crosscut.

4. Doors should be erected in pairs to form airlocks; where this is not feasible, tight check curtains, well maintained, should be hung in connection with single doors.

5. Flame safety lamps should be properly cleaned and assembled by a competent person before each period of use. Lamp assembly should again be thoroughly checked by the person using the lamp immediately before he enters the mine. Flame safety lamps should not be disassembled at or near the face region in any mine known to give off explosive gas.

6. Tests for gas should be made before and during the cutting and loading operations and before and after blasting. Additional tests for gas should be made at regular intervals in working places where gas feeders are known to exist. If a dangerous amount of gas is found, the usual work should be stopped and the gas removed, preferably on an off shift.

7. Provision should be made by the management for adequate continuous ventilation of all active working places, and the maintenance of effective ventilation should be of primary importance. Other mine employees should cooperate so that established ventilation is not disturbed or destroyed by their changing the normal position of curtains, doors, or other ventilation installations without orders to do so.

## Dust

1. Rock dusting should be continued in all sections of the mine. All open places should be kept thoroughly rock-dusted to within 40 feet of the face except where floor, roof, and sides are wet.

2. Rock dust should be distributed upon the top, floor, and sides of places dusted and maintained in such quantity that the incombustible content will not be less than 65 percent. When methane is present in the ventilating current, the 65 percent minimum of incombustible should be increased 1 percent for each 0.1 percent methane.

## Machinery and Electricity Underground

1. Open-type electrical equipment should be replaced by permissible equipment when replacements are made.

2. Nonpermissible mining equipment should be used only where an ample volume of intake air is in circulation.

3. No changes should be made in permissible equipment which void its permissibility; such changes are likely to introduce gas-ignition hazards.

4. Connections joining one section of a cable with another should be made with splice boxes rather than with separable plugs.

#### First Aid and Mine Rescue

1. At least 12 men should be trained in mine rescue and recovery work and should be given additional training monthly.

2. Self-rescuers should be readily available for underground employees, and the employees should be instructed in their use.

#### General

1. Search of employees for smoking material, matches, and other lighting devices should be made at frequent intervals to assure that such articles are not carried into the mine.

2. All officials, including the face bosses, should have thorough training in the hazards of gas and dust explosions and in the proper measures for controlling such hazards. Supervisors should have the authority and responsibility for enforcing the observance of safety rules and regulations.

#### ACKNOWLEDGMENT

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Respectfully submitted

R.D. REEDER  
Coal-Mine Inspector

J. HOWARD BIRD  
Mining Engineer.





List of Deceased Miners

<u>Name</u>	<u>Occupation</u>	<u>Age</u>	<u>Dependents</u>
Marius H. Bradak	Ventilation and safety	56	1
James Jardine	Face boss	43	2
James Wyoharly	Shovel operator	37	4
Warren Hotchkiss	Pipeman	52	0
Lawrence Figueroa	Shovel operator	38	4
Clell Forsyth	Machine operator	36	4
Virgil Stamper	" "	23	3
Ira Hill	Machine helper	47	1
Nick Sandoval	Motorman	27	4
Manuel Trujillo	Nipper	27	6
Orvil Stubblefield	Trackman	27	3
Thomas D. Vigil	"	73	2
Jose E. Montoya	"	39	5
Juan Martinez	Timberman	37	6
Efran Manzanares	"	39	4
Irving M. Leonard	Pipeman	48	4
Bud Walton	Mason	55	1
James Gilmour	Face boss	54	2
Joe D. Padilla	Trackman	42	7
Pedro Galvaldon	Faceman	51	0
James Bailey	Timberman	40	1*
Cornelio Dalla Corte	"	54	0
Denshiro Niitsuma	"	46	<u>8</u>
Total			72

\*Question of dependency not yet determined.



- A. Up here. I think he was in this back entry and he got down into the face and missed Jardine and got into the face without seeing the face boss.
- Q. Where was Jardine's body found?
- A. Right here almost opposite the frog where the switch takes in, the Third Left back.
- Q. Was that pump in your opinion permissible or nonpermissible equipment?
- A. Nonpermissible.
- Q. Who ordered the pump installed?
- A. I guess it was me.
- Q. And those orders were relayed to the mine foreman?
- A. Yes
- Q. You gave Mr. Markosek orders to install it and he had the men install it?
- A. Yes
- Q. What in your opinion, Mr. Morrison, would cause or bring about the accumulation of methane gas in that lower section of the Third Left entry?
- A. The only reason I can see for it, if there had been a stopping knocked down. I know when I went through there that morning the ventilation was good, but there could have been one of these stoppings left out.
- Q. Were there any permanent stoppings constructed?
- A. Not from here down. He was starting to put in a stopping, and I think the material is there now.
- Q. There were four crosscuts with temporary brattice stoppings?
- Q. When did you see Bradak alone last?
- A. Oh, I judge along about 9 o'clock that morning.
- Q. Did you give him any instructions at all?
- A. Yes, I gave him instructions for that day. He was to measure the opening and make a square section into the return.
- Q. Measure the opening?
- A. Yes, measure the station.

Q. You instructed him to get accurate measurements?

A. Yes.

Q. When was the last search of the employees made for matches and smoking material?

A. I could not say off hand.

Q. Did you do that frequently?

A. Yes, we generally made it a practice once a week.

Q. But you didn't know how long it had been since you last searched?

A. No.

Q. Are those searches of all the men on at spots in the mine?

A. No; just made at the bath house as we start in.

Q. Of all of them?

A. Yes.

Q. How far, or how often did the fire boss inspect the Second Left entry?

A. About every other day.

Q. Any gas accumulations found?

A. No sir; not since the crosscut was run through there.

Q. What delayed Jardine from 12 to 3:12 o'clock when his body was found up the Third Left when he was trying to cut the power? There is a lapse of better than 3 hours?

A. The cutting machine was in there that morning.

Q. In where the pump was?

A. At the face of the back entry; they cut that place and drilled it and they hadn't done that when I was there between 11:30 and 12 o'clock. To drill and shoot that would take at least 2 hours.

Q. Why would he proceed to cut and drill in a place that was making gas?

A. I guess the gas was cleared out or he would not have let them work; and he probably struck this feeder.

Q. Mr. Morrison, was that pump operating on the afternoon of May 9 around 3 o'clock?

A. My honest opinion, No; I don't think so.

Q. Was the current still running through it or cut off?

A. It was cut off when we got there.

Q. You were among the first ones in there?

A. I think right close to the first ones.

Q. The power was cut off when you got there?

A. Yes.

Q. You said that you think the pump was not operating at the time?

A. Yes (You mean at the time of the accident)

Q. At the time of the explosion?

A. Yes

Q. What makes you believe it was not operating?

A. Mr. Hotchkiss and Mr. Leonard, it is their duty to go around there about quitting time and shut the pump down in this section.

Mr. Leonard was taking off at Third Left. He was going to shut the pump off and install two lengths of pipe up here.

Q. On Third Left?

A. It looked to me like they had started out.

Q. Started out of Third Left?

A. Yes. I examined the pump and the valve was shut off. It was the general practice of Mr. Leonard when he shuts the pump down, he pulls the discharge valve.

Q. That is an assumption on your part?

A. That is all.

Q. You don't know that to be a fact?

A. No.

Q. You say the power was taken from the pump, disconnected; that was a Miller plug pump?

A. Yes

Q. You don't know whether that was disconnected by some person or by the force of the explosion?

A. No.

Q. Mr. Morrison, when you were through at 11:30 or 12 o'clock the pump was operating?

A. No sir; he had just shut it down.

Q. At 12 noon?

A. Yes

Q. Was that by reason of the fact that the water had been pumped out?

A. Yes, to cut in this cutting place.

Q. Would they turn the pump on sometime later in the afternoon?

A. No, I don't think there was any necessity for it. When the pump was down what little water that would accumulate the loader would handle it.

Q. In your opinion if the men turned the water off on the discharge pump that would be about 12 o'clock noon?

A. Yes

Q. That is about the time he would pass by and stop the operation of the pump?

A. Yes

Testimony by Frank Markosek, Jr., Mine Foreman

He reported that the pump was installed in 3 left on Sunday May 6.

Q. Was there any reason for that pump operating after you left?

A. Yes

Q. For what reason?

A. The accumulation of water.

Q. Did you think there would be more accumulation in the place?

A. Yes

Q. In your opinion there was?

A. Yes

Q. Have you any grounds for saying that?

A. Yes; it would flow in there so they could not get the coal out.

Q. You weren't in the Third Left after 11 o'clock?

A. No

Q. But your opinion is that the pump was operating along about 2 or 3 o'clock in the afternoon?

A. According to the amount of water that was down there when we first got down there I would not say it was.

Q. But you think the chances that it was operating in the afternoon was good?

A. Yes

Q. It would have been normal for it to have operated?

A. Yes

Q. You think it would be necessary for them to take the water out for them to cut the place?

A. Yes

Q. There was no cutting when you left?

A. No

Q. After the place was cut would it be necessary to have it down to shoot?

A. No; as a rule when it is prepared to shoot the boss goes in and inspects and blasts immediately, and with the shovel we could take care of it.

Q. Do you think there was a good reason for the shift that was on to move that water before the on-coming shift came on?

A. Yes .....

A. I (Markosek, Jr.) proceeded along that motor road and went into the Second Dip, and it seemed like when I hit the Second Dip the air was worse there.

Q. That means smoke and stuff?

A. Yes. When I got right to the slope in the Second Dip I ran into Parley Hinkins and my brother. I asked them if they had any phone calls and they said no.

According to Markosek, the first man found in First right was Tony Leger; the second man a colored fellow; the third man Tony Trujello; and the fourth man Guadalupe Sandoval, who was dead.



(Markosek, Jr.) From the First Left section I didn't know whether they had gotten out or not. Anyway, I came back to this crosscut here and proceeded up here and ran into John Gutierrez. He was lying on his side, and there was just a trace of blood coming out of his nose, but not his mouth. When I scraped his nostrils out I scraped quite a bit of blood out of his nostrils. I kept walking up through the machine shop. I walked up to where these two men were about 40 feet above the crosscut, and they were lying in a V shape. One man was lying with his face down and his hat was off his head and his face was full of dirt and his eyes wide open and filled with cinders. I scraped him off and turned him over; and the fellow next to him Gilmour, there was blood on his body. I still had not accounted for the Joy operator, Morton Dean. After I had looked at Gilmour I proceeded up this slope about 100 feet. My next thought was to go back to the telephone and try to call the top to tell them what was left down there and for them to come down and give me a hand...

I walked on down here and ran into this Joy operator, and I pulled him out and I went on up the slope and I met my brother Edward, Parley Hinkins, and Themell Christensen. I asked them if there was any water we could take back down to these fellows. My brother came down with a canteen about one-third full of water, and we proceeded back down that slope and got back to the bodies. I took a bandage out of the first-aid kit and went down and washed the faces of all the men that had signs of life. And while we were doing this Archie Morrison came down.

Q. Did he have someone with him?

A. Yes, he had help with him. Then after I had gone along and cleaned the faces of these fellows they came along and we picked these fellows up. Our telephone line was shorted on the motor and we had to trace the trouble on the bell line. Then we got the bodies on the motor and rushed them to the outside. After we got them outside then they picked up the rest of the fellows. After I had done all this I walked up this slope and back down and my knees began to get wobbly. I told them I was going to the outside to get a cup of coffee; and immediately after that I went right back into the mine.

Q. About what time in the afternoon do you guess these men reached the outside, that you loaded onto the man trip?

A. I presume right around 4 o'clock.

Q. The State Mine Inspector met you about a quarter to five; do you know how Mr. Harvey was notified?

A. No.

Bradak's body was found about 10 feet from the pump.

Q. What would you say Mr. Bradak was doing at the time of this accident?

A. So far as I know Mr. Bradak on that particular day was establishing taking the air readings.

Q. Do you think he was taking air readings at the time of the accident?

A. Yes

Q. That would be his only reason for being there?

A. Yes

Q. To take air readings?

A. Yes

Q. Do you think that is the only time during the day he had taken air readings?

A. He had been taking them all day.

Q. On the day of the 9th?

A. He had been the whole day air reading. This was his last place; he went to get the reading because he had been talking to Freeman.

Q. Where?

A. First Left dip, 45 minutes before the explosion, and he told Freeman he was going back to Third Left.

Q. To take an air reading?

A. Yes

Q. That would be his last place?

A. Yes

Q. Had others been there and taken air readings during the day prior to that time?

A. No

Q. Have you any opinion as to what caused the explosion?

A. The only thing - well, in my mind that if, - not saying it - if Jim Jardine shot this place in the back slope, when he shot this there could have been a possibility he released a big body of gas from the fault, because along this fault there is cracks and crevices, and there is a possibility when he shot he bit into one of these crevices that could have been loaded with gas.

Q. And he detonated that gas, or ignited it?

A. Yes, I have no idea what could have ignited it unless there was a stray current going through the wires.

- Q. But you weren't operating any motors in that vicinity?
- A. No, but there could have been a possibility there was a motor in some other section of the mine operating, throwing this stray current into release.
- Q. That pump could have been operating?
- A. Yes, but I don't think it was operating at that particular time for this reason: As many times as I have noticed those pumpmen turn their pumps off, they will throw the motor off first, and then shut the valve off on the bottom.
- Q. Do you think there is any possibility of a safety lamp coming into it?
- A. There could be a possibility, but I don't think there was.
- Q. Where was that safety lamp found?
- A. I could not tell you. I was not there when it was found.
- Q. One thing I failed to bring out here, and that is regarding the power in this section. When was the power pulled in that section involved in the explosion?
- A. Immediately after I got to the master switch.
- Q. Where is that located?
- A. Across the track, the main power.
- Q. You pulled that before you went down the slope?
- A. Yes; I also pulled the one coming out of First Dip. On going to the telephone I also called out and told them not to put any D. C. power on that line until I notified them.
- Q. You didn't shoot prior to this explosion?
- A. Yes, that particular place had been shot from the time I left up to quitting time.
- Q. About what hour would that be?
- A. When I left there a little after eleven they were still drilling that place, so I presume it was shot an hour or fifty-five minutes after drilling; so that must have come right after dinner.
- Q. They were shot?
- A. Yes
- Q. They would drill some in that coal in the afternoon?

- A. That place still was not cleaned up when we came back to make the inspection; the loading machine was in place.

Testimony of Frank Markosek, Sr., Fire Boss

- Q. Did you observe a pump at that location when you went down that morning?
- A. Yes. The pumpman was behind me and started the pump. I was putting up that brattice and he came there.
- Q. What was the pumpman's name?
- A. Hotchkiss
- Q. Did you see him start the pump?
- A. Yes
- Q. How did he do it?
- A. Pushed a button.
- Q. Didn't have any trouble?
- A. No
- Q. The pump started?
- A. Yes; he pushed a button and opened a valve.
- Q. Was the pump operating at 11 o'clock when you left?
- A. No, because there was no water down there. They were cutting and the water mixes with the dust.
- Q. The pump was down at 11 o'clock?
- A. Yes

Testimony by A. D. Freeman, Face Boss

- Q. What were you doing on the morning of May 9?
- A. I was a face boss.
- Q. How many men did you have under your direction?
- A. Seven.
- Q. What part of the mine would you ordinarily work in?
- A. First Left in First Dip.

- Q. Did you hear anything in this area that was unusual - between 1 and 3 o'clock?
- A. Yes
- Q. What happened?
- A. I would have to back up a little on my story to show you how the conversation came about. The safety man, Bradak, was working up here with a crew of men in a new motor road along about 10 o'clock in the day, and Mr. Morrison came through this section.
- Q. On First Left?
- A. On First Left where I was working and inspected my places and then proceeded on and where he went from there I don't know. But at about 10 o'clock he informed me there was quite a bunch of loose rails and material that should be got out, and he said he would have a rail truck.....
- Q. On the new motor road?
- A. Yes, He said, I will send a truck down and you get your men after quitting time to load these rails out. I said, who has the truck up there? And he said Bradak and his crew. Then at 2:30 I decided it was getting about time that those rails.....that the rail truck should begin to arrive; so, I went over to these places a couple hundred feet back this way.
- Q. Back from the First Left?
- A. Back towards the Second Dip. I went into this area to see what material there was to be taken out. While I was standing there, I was approached by Bradak and Leonard the pipeman.
- Q. About 2:30?
- A. Yes, it was 2:30 because my attention was called to the fact that somebody asked me what time it was, and it was 2:30; and he informed me that the Third Left back entry, the air, he said was full of gas.
- Q. Bradak said that?
- A. Bradak said it was full of gas. I said "What time are you going to send this rail truck down to me?" He said "You are not going to get the rail truck now." I said Morrison was through before noon and told me I would get the rail truck. He said, I was talking to him and told him that we could not get the truck to you. He says "We have 12,000 cubic feet of air, and you only need 5,000" and he said "I am going up to the regulator," right up in here is the regulator; he says "I am going into the regulator and shut off 7,000 feet of air from this area." He went up into the Third Left area, back entry, and repeated again that he was going to take care of the gas.

- Q. He meant that he was going to pass the gas out by extra ventilation?
- A. Yes, he was going to use it for that purpose. I didn't need the air; he was right. He was with his partner and he didn't have any safety lamp, but he did have his anemometer with him. He paused in his conversation as though he might send his partner back up to the parting at the hoist where he had left his lunch bucket; and he said, "No, I ain't got my safety lamp;" and he turned and looked at this colored man as though he was going to send him back for it. He says, "Oh well, just let it go; I am only going to take the readings anyway." He said "If I do need a safety lamp I can borrow one of yours."
- Q. The statement he made that the Third Left was full of gas, he meant that the place was giving off gas or the place was full of gas?
- A. No, not loaded with gas; no, he didn't mean that there was any excitement about it; no big rush of gas, but he did need this additional air over there.
- Q. After Bradak left you, you assumed he was going to Third Left?
- A. That is where he said he was going. This man Leonard was there too. He asked "Are you going to Third Left, Brakak?" And he says "yes I am." He says "I have got to go over there to pull the plug on the pump. And I said "If you fellows have all this to do you have got a chance of missing the man-trip outside." They said "We can catch the man-trip on the Second Dip instead of coming back through."
- Q. Was it Bradak's regular job to pull the plug on the pump?
- A. No, it was not his job.
- Q. Why was Bradak going to pull the switch plug for Leonard?
- A. The plug-pulling on the pump was a remark made by the pumpman.
- Q. What was his name?
- A. Irving Leonard; he made the remark.
- Q. To Mr. Bradak?
- A. To Mr. Bradak and the colored fellow.
- Q. He should pull the plug on the pump?
- A. Yes.
- Q. Why did he ask them to pull the plug?
- A. He didn't ask them to pull the plug. He said he had to go to the same area to accomplish that job before he was finished because it was about

quitting time; but he didn't seem so much interested in the conversation about the air. The two men were going the same way, so he made the remark what he had to accomplish; and I told them they ought to be on the way because it was getting close to quitting time.

Q. Leonard was the operator of the pump in the Third Left?

A. He was the operator of the pump; he is the pumpman. I didn't know what pumps he operated. Also, there was another pumpman also employed up in this area, but I didn't know his name.

Q. Was it Hotchkiss?

A. Hotchkiss, yes, he was in this area.

Q. Where were you at the time of the explosion?

A. I was sitting right here - up on First Left; the First Dip.

Q. What was your reaction?

A. My first reaction was not so bad - it was bad enough of course. There was two concussions. I came to the conclusions that we had stoppings right here, concrete stoppings.

Q. Where is that?

A. That is where the First Left intersects Second Dip. It is a place you can travel through.

Q. First Left Second Dip?

A. That is right. There was a concrete stopping there. I figured the second concussion - I could see when this brattice went out; I think it bent it right around. The second one was more of a splitting sound.

Q. It could have been by the same explosion?

A. According to my opinion I would say it was the same explosion.

Q. How many were with you?

A. There were four of us there at the time.

Q. The smoke and gas came up?

A. Nothing but rock dust.

Q. What did you do when the report of the explosion struck you?

A. The first thing I done; I realized it pulled me down, and I realized there had been an explosion because I had experienced them before, but

I didn't know where. I realized the fact that I should keep my head working and keep the men from getting excited and cause them to run away. So I consoled the men and began telling them little lies, and I told them the motorman had knocked some timbers down and stirred up the rock dust. We were getting out about 20 minutes too early, and I told them I would give them 20 minutes if they would walk behind me I was going to take it slow enough to take care of them and have them walk behind me.

Q. You walked out of First Left?

A. I came out on the main entry here.

Q. The First Left at the First Dip?

A. Yes. I kept them together and brought them up to the hoist, and the men were together at the hoist. We had 20 minutes to quitting time, so I let them have that 20 minutes and walked out until I met Mr. Morrison, and asked, or he asked me what was the matter, and I told him what I thought was the matter.

Q. What did he say?

A. I said I think there is an explosion, and he said you better let your men go ahead and you go back with me. There is a telephone at the First Dip, and he went to the telephone and went to take care of his business from there on. He went down into that rescue area to bring them up and give them artificial respiration.

Q. That covers it pretty well so far as you recall?

A. That is all I could say about it. I could not hardly identify the location of the bodies.

Q. You weren't with the boys when they found Bradak's body?

A. No, I was at the telephone station to take care of the calls.

Testimony by R. D. Faddis - Kaiser Co., Inc.

Q. You were with the rescue crew from the Kaiser Company?

A. Yes

Q. What time did you arrive on the scene?

A. The exact time I could not say; roughly sometime between 3:30 and 4 o'clock.

Q. You went right down into the mine?

A. Yes, left immediately.



- Q. When you arrived at the Second Left Dip what was your first job?
- A. That is the bottom of the hoist.
- Q. That is where the overcast was blown out?
- A. The first job we had, after ascertaining that vicinity was all right was to make an exploration trip down Second Left.
- Q. Under whose direction?
- A. Under the direction of the leader of the First-Aid crew, John Cullen. He was captain of the crew.
- Q. What was the purpose of that trip?
- A. To ascertain whether there was any fires in that particular district or any possibility of men being barricaded off.
- Q. You didn't find any?
- A. No live ones.
- Q. During any of your exploration down in the Second Left main back entry did you locate a safety lamp?
- A. A part of a safety lamp.
- Q. Which part did you find?
- A. The bonnet and the fount.
- Q. Will you point to where it was?
- A. The bonnet of this lamp was found just out from this slant in the last open crosscut located there on the left hand side of the track, and the fount there.
- Q. There was a fall here?
- A. There was a fall here.
- Q. Where the cars were?
- A. Yes
- Q. Between the cars and the fall that buried the four men?
- A. As I remember we had passed this slant when we found the fount; it was over close to this slant and out from the slant.
- Q. They were both in this vicinity?
- A. Yes, sir

Q. I have some pictures of the fount of that lamp; I wonder if you could identify that as what you found?

A. Well, when I saw this fount it was laying upside down. That is all there was of the fount.

Q. What was the condition of it?

A. Yes.

Q. The Standards were off?

A. Yes; the fount was in the same condition as this picture when it was found; that could be it, yes.

Q. We have not been able to find the bonnet.

A. The bonnet was left where it was. It was picked up and looked at and thrown down at the same place where it was found.

Q. Did the bonnet you found have the standards on it?

A. No, there were neither standards or top; just the bonnet itself.

Q. Just the bonnet itself?

A. Yes.

Testimony by L. L. Alger - Kaiser Co., Inc.

Q. For which company are you working now?

A. Kaiser Company.

Q. You visited the Sunnyside mine, the place of the explosion on May 9?

A. Yes, I did.

Q. Will you tell us just what you found when you entered the mine? You came down this dip?

A. Yes.

Q. And turned in here?

A. Yes.

Q. Did you run across a safety lamp?

A. Yes.

Q. Where was it lying?

A. The safety lamp was right here.

Q. How many feet from this pump?

A. It would be about 40 or 50 feet.

Q. Was it still normal?

A. It was just the bonnet of the safety lamp.

Q. Did you pick it up?

A. I didn't pick it up, but it was close; I didn't have it in my hand myself.

Q. You don't know what happened to it?

A. No, only to set it back down.

Q. And you fellows went about your work.

A. Yes

Q. Did you find the bottom of the lamp, the fount?

A. No; but they were looking at the fount. I think at the time they found the fount you (Harvey) and I were in this slant up here. As near as I can tell they were examining the fount down about here.

Q. That would be between the first and second open slants from the face?

A. Yes

Q. But you did see the fount?

A. I did see the fount, yes.

Q. That is where they were examining it?

A. Yes

Testimony of Elias O. Jackson, Mine Foreman,  
Independent Coal and Coke Company

Q. Were you dispatched to the No. 1 mine of the Utah Fuel Company on May 9? Were you in a certain rescue work?

A. Yes, about 12 o'clock.

Q. I assume you went down this Second Dip here?

A. Yes

Q. And then you went through here into the Third Left?

A. And the back entry, yes.

Q. Did you find a safety lamp on your way to Third Left?

A. Not until the night was nearly over.

Q. About what time would it be?

A. I imagine it was about 8 o'clock the next morning.

Q. Where did you find that lamp?

A. Just about where you have this.

Q. In the Third Left?

A. Yes, we came up and I had repaired the brattice in these crosscuts I imagine about 35 feet out of this intersection on the left side.

Q. That would be where Third Left takes off from Second Left?

A. Yes.

Q. Did you find a whole lamp?

A. No, just the bottom.

Q. Did you look at it?

A. Yes.

Q. What did you do with it?

A. We brought it out and put it close to the telephone.

Q. That is the last you saw it?

A. Yes.

Q. Did it appear damaged?

A. Yes, all that was left was the fount.

Q. What do you imagine happened to it?

A. I think it had been blown from Jardine's lamp. It had been carried over from the blast into this place.

Q. By the force of the explosion?

A. I had the understanding he was going down there where the lamp was.

Q. Do you have any reason to believe that the lamp had been found before and carried over to that place, or was it apparently undisturbed?

A. It was just blown into this place with the dust. There were particles of dust and wood blown into the rib, and we were looking at them when this fellow picked it up right at my feet.

Q. It had not been taken there?

A. No, it was apparent it had been blown there when we found it.

Q. Can you give us the name of it?

A. It was Koehler.

Q. Would you say that might be the one?

A. Yes.

Q. Was Mr. Jardine's lamp found close to his body?

A. I don't know.

(Mr. Harvey): - The bottom ring of the hook was found within 20 feet of Mr. Jardine's body with one standard still fastened in the ring. The other end of this standard about half an inch in diameter that was lying there. The hook and top shield were together and lying out on the parting and we picked it up while the cleaning was being done. We did not find the fount anywhere around that section, which may lead to the belief that this was also a part of Jardine's lamp.

Q. What did you do with that lamp? Did you give it to Frank Markosek?

A. Joe may have gotten it, because he was with our group. We put it down there and we meant to tell the incoming crew about the lamp, because I didn't think they wanted it brought out, but it slipped my mind.

Testimony by Mr. Archie Morrison, Mine Superintendent

Q. As superintendent, Mr. Morrison, is it the practice to require safety lamps?

A. Just the machine men and the face bosses prepare their own lamps.

Q. They prepare their own lamps?

A. Yes sir.

Q. And your practice or Mr. Bradak and I think other boys, the bosses - Freeman didn't have a safety lamp. In your opinion he didn't bother with a safety lamp?

A. I know he didn't have one.

R. D. REEDER

(COPY)

June 5, 1945

REPORT OF EXPLOSION ON UTAH FUEL COMPANY'S SUNNYSIDE  
#1 MINE ON MAY 9, 1945 AT APPROXIMATELY 3:12 P.M.

On May 17, 1945 the Industrial Commission held a hearing, conducted by Chairman E. M. Royle and R. H. Dalrymple.

From testimony given by witnesses it is a known fact that gas feeders were active and liberating gas ( $\text{CH}_4$ ) - one (1) at the face of 3rd Left Main Entry and one (1) approximately thirty feet (30') outby the face of 3rd Left Back Entry, as they had been reported by Frank Markosek, Sr., Fire Boss who reported exception observed on his pre-shift examination of those two (2) places on May 9, 1945 and by extending brattice lines and proper coursing of air same was pronounced clear, by him, at 8 A.M. May 9, 1945 and safe for men to proceed to work in their normal manner. He also made two (2) re-inspections of the two (2) places in question which extended up to about 11 A.M. May 9, 1945 and both times found them free of gas as checked by his permissible flame safety lamp; on his two (2) re-inspection visits to the 3rd Left Main and Back Entry he observed that brattice curtains used to control and direct air current to the working faces had been deranged in such manner as to disrupt the ventilation. He warned the men against this practice as it was, specially, unsafe due to the known gas feeders.

Mr. Morrison, Superintendent, and Mr. Markosek, Jr., Mine Foreman, on their tour of inspection on May 9th visited the 3rd Left Main and Back entry faces between the hours of 11 A.M. and 12 Noon and while there inspected the 3rd Left Main and Back Entry faces, with a permissible flame safety lamp, and found them free of gas. From 12 noon until the explosion occurred, at approximately 3:12 P.M. there was no evidence presented to enlighten us as to what may have happened which caused the dangerous atmospheric conditions or the source of ignition.

There isn't any conclusive evidence to establish the fact that the primary oil switch, located on overcast at intersection of 2nd Left off 2nd Dip, had been pulled to cut off power in line leading into and serving 3rd Left Main and back mechanical equipment, namely - 7 A.U. cutting machine, 360 Goodman track loader and non-permissible centrifugal pump - or that permissible flame safety lamps weren't in a safe working condition or that pump was operating at the time of explosion. We do know that matches and cigarettes were found on the body of one of the victims - but, to accuse, beyond a reasonable doubt, or dismiss any one of them as a source of ignition would be pure conjecture.

FACTS DISCLOSED AT HEARING WHICH ARE NOT CONDUCTIVE TO SAFETY  
OR THE SAFE OPERATION OF A COAL MINE

Frequent searching of underground employees for matches or smoking material:

The officials were very lax in doing this, in fact it was stated that it had been approximately six (6) months since the last search of employees had been made. (Statement made by F. Markosck, Jr., Mine Foreman).

"Non-Permissible Equipment - Section 69

At all working faces in gassy mines as defined in Section 20 of these orders, only permissible electrical equipment as defined by the United States Bureau of Mines, shall be used for the mining of coal in this state; said permissible equipment shall not only be so constructed that it will not ignite gassy mine atmospheres should such atmospheres through neglect or accident surround such equipment, but it shall also bear the approval stamp of the United States Bureau of Mines."

"Section 26 - Sub-Section 3

That permissible electrical equipment and drilling machines, approved by the Bureau of Mines, be used exclusively at the working faces in all gassy mines."

A non-permissible centrifugal pump had been installed May 6, 1945 which was approximately fifty (50) feet outby the face of the 3rd Left Back Entry, at the time of the explosion, on the return side of the ventilating current and was exposed to the air which had coursed the working faces on the 3rd Left Main and Back entries.

"Section 101

The tracks of all main haulage systems that use a rail return shall be bonded at every joint and around switches, frogs and other track openings. Such track shall be cross bonded not to exceed every 300 feet."

Operating electric haulage motor over unbonded track in 3rd Left Back Entry on the return air current.

Although the source of ignition is not knowingly chargeable to the use of non-permissible equipment or unbonded track in the 3rd Left district, the fact remains that in using other than permissible equipment in a mine classified as gassy, is contributing to a practice that can and, oft time, does result in disaster.

In view of the findings above relative to practices and conditions not conducive to safe mining operations, it appears that the top management is due, appropriately, for a considerable measure of censure. Unbonded rails and a "non-permissible" pump constituted a continuing threat to the safety of men underground when gas was present.

The fact that gas was encountered on May 2, 1945 and that both shifts of workmen had known of its presence prior to May 9, 1945 and that company officials could not have failed to have known of this hazard, brings the inevitable conclusion: that a more scrupulous attention to these two factors could have been paid. We are not overlooking the fact that men were not searched systematically.

Under the known gaseous condition of the 3rd Left, the management could have, and should have, suspended coal mining operations in the 3rd Left until a permissible pump had been installed and rail bonding completed. Said pump was installed three days prior to the explosion.

While the liberating of an unusually heavy concentration of methane gas into the 3rd Left during the afternoon of May 9, 1945 probably could not have been anticipated or foreseen and perhaps the ventilating equipment was equal to the ordinary mining demands than being made upon it, the fact that electrical mechanical agents capable of igniting a gas concentration were permitted to function in the mine in a section known to be producing gas is a definite responsibility that must be borne by management including these officials directly in charge of operations, and no one else.

That a more meticulous attention to General Safety Orders or Code of the Industrial Commission as issued May, 1943 as they relate to the electrical equipment, namely, pump and unbonded rails, when the mine was known to have been producing gas in the 3rd Left section would have eliminated at least these two conditions as factors of controversy as agents suspected of offering the ignition spark of the gas explosion.

The damage to life, reputation and property has been done. The revoking of certificates of sub-management cannot restore conditions as they were prior to May 9, 1945. The unknown factor is: the amount of pressure that may have been exerted by top management on those filling executive positions below them for coal output at the expense of mine safety.

One cannot escape the conclusion that top officials were negligent in several respects. This laxity cannot be passed to subordinates. The responsibility rests with management when management is in direct control, as it appears in this case.

It should be the universal and unalterable rule of all mining companies that every order or rule relating to safety in mining be respected fully and completely when any known hazard exists. Men's lives should not be gambled against any known hazard such as provided by "non-permissible" pump, unbonded rails, and matches on workmen underground.

THE INDUSTRIAL COMMISSION OF UTAH

/s/ E. M. Royle  
Chairman

O. A. Wiesley

R. H. Dalrymple



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## REPORT OF LOCAL UNION

United Mine Workers of America Investigating Committee

Sunnyside, Utah  
May 12, 1945

### TO WHOM IT MAY CONCERN:

We the undersigned, a committee representing Local Union 6244, United Mine Workers of America, made an investigation into the mine disaster which occurred on May 9th 1945 at the Utah Fuel Company properties, #1 Mine at Sunnyside, Utah, which resulted in the deaths of twenty three employees and injuries to seven others employed in #1 mine.

We were accompanied on the investigation by the Utah State Coal Mine Inspector, Mr. Stanley Harvey, Deputy Utah State Coal Mine Inspector, Mr. Robert Schultz, and Mr. J. Howard Bird of the Bureau of Mines. We visited all the areas connected with the explosion including 2nd Dip entries known as the 2nd left, 3rd left, 4th left and 1st right, and the raises from the 4th left entry, the location of all the dead and injured had been clearly marked by rescue men, also the names of each one was given to us in the location they were found. Information was also furnished by the Utah State Mine Inspection Officials and all questions asked of these Officials were answered.

### Our investigation showed the following:

There were two gas feeders, one on 3rd main entry the other on 3rd back entry approximately fifteen feet ahead of a pump. They were giving off quite a large amount of gas. They were tested in our presence; one was giving off over five percent methane as showed by the State Mine Inspector's methane detector which showed the maximum that the detector will show, this being five percent. There must have been more but it could not be registered on the detector. It was also tested by safety lamp and showed a good cap immediately. A test was made in the high side corner of the place showing the presence of gas, proving conclusively that there was quite a body of gas being given off by these feeders prior to the disaster. The course of the air was taking the gas, formed in these places through to the 3rd left back entry by brattice. There was a pump in the return air course behind the brattice approximately one hundred feet ahead of the last crosscut; the pump was not of the permissible type. The switch of the pump was removed in our presence for shipment and examination by the Bureau of Mines; the valves of the pump were closed, apparently the pump had been shut off. The rails in the immediate vicinity of the explosion were not bonded; this, along with the location of the pump of nonpermissible type was gross negligence on the part of the management. We found the motor in the 2nd left main entry, the controls being in the following position; the traveling control was in the neutral position and the power control was in the off position; the main A. C. switch was pulled at the parting. We couldn't learn whether or not the rescue men or the Unit Foremen in charge at the time of the explosion had pulled the main switch as it was about the time the men begin to dress to go out (quitting time) when the blast occurred.

Our investigation showed that the line of fire was on second and third left entries going down to the 4th left entry. Rock dusting of the mine just previous to the explosion we believe was responsible for localizing the explosion, saving a greater loss of lives.

#### CONCLUSION

We are of the firm opinion that the direct cause of the explosion was the result of the ignition of the gas given off by the gas feeders mentioned above. The gas could have been ignited in several ways but from our investigation it was impossible to determine the direct source the gas became ignited.

Respectfully submitted

/s/ Albert Roberts  
William R. Cox  
Elmer Brinley  
Lawrence E. Misner  
Investigating Committee

OF MINES SU 89 MAY 10 905 AM

E H DENNY

② File

LOCAL GAS IGNITION PROBABLY AT FAULT NEAR FACE NEW THIRD LEFT  
ENTRY OF SECOND DIP SUNNYSIDE NO. 1 MINE AT 312 PM WEDNESDAY  
RESULTED IN DEATH OF 23 MEN AND INJURY TO 7 MEN. 57 OTHER MEN  
ESCAPED UNINJURED. 21 BODIES RECOVERED. RECOVERY OTHER 2 BODIES  
EXPECTED SOON. VENTILATION EQUIPMENT NOT DAMAGED. RECOVERY WORK IN  
FRESH AIR. CAUSE OF EXPLOSION NOT DETERMINED. PUMP ON RETURN  
SUSPECTED. WASHINGTON NOTIFIED

R D REEDER

END ACK PLS BR

Name:

*Denny*

Form No. 1-1027

(April 1943)

EXT:

Rm:

UNITED STATES  
DEPARTMENT OF THE INTERIOR

Sent:

a. m.

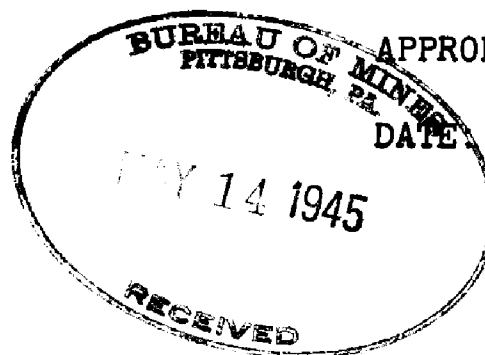
p. m.

TELETYPE MESSAGE

BUREAU: Mines

SEND TO: E. H. Denny

Mr. E. H. Denny  
Bureau of Mines  
4800 Forbes St.  
Pittsburgh 13, Pa.



APPROPRIATION:

May 10, 1945

*9*

Local gas ignition probably at fault near face new third left entry of second dip Sunnyside No. 1 mine at 3:12 p.m. Wednesday resulted in death of twenty three men and injury to seven men. Fifty seven other men escaped uninjured. Twenty one bodies recovered; recovery other two bodies expected soon. Ventilation equipment not damaged. Recovery work in fresh air. Cause of explosion not determined. Pump on return suspected. Washington notified

Conf. Mr. Denny

R. D. REEDER

*File*

Salt Lake City, Utah  
May 10, 1945

Mr. Denny:

Local gas ignition, probably at fault near face new third left entry of second dip, Sunnyside No. 1 mine, at 3:12 p.m., Wednesday, resulted in death of 23 men and injury to 7 men. 57 other men escaped uninjured. 21 bodies recovered. Recovery other 2 bodies expected soon. Ventilation equipment not damaged, recovery work in fresh air. Cause of explosion not determined. Pump on return suspected. Washington notified.

R. D. Reeder

Telegram rec'd. 11:10 a.m., 5/10/45 by FF

*6*

BUR OF MINES PGH GA PLS-

S

V ON LNE

ON LINE PLS OK PLS ANNOUNCE PG

GA PLS

BUR OF MINES SU 89

MAY 11

1025 AM

mmc

12125

✓  
E H DENNY

THE LAST BODY, TWENTY THIRD, RECOVERED THIS MORNING FROM UNDERNEATH  
FALL 2 LEFT PARTING. ONE BODY RECOVERED LATE YESTERDAY FROM  
UNDERNEATH FALL NEW 3 LEFT ENTRY. INVESTIGATION TO BE MADE  
SATURDAY. \* BIRD REPRESENTING BUREAU AT INVESTIGATION. ROCK DUST  
RESTRICTED PROPERTY DAMAGE TO AREA OFF 2 DIP. WASHINGTON  
NOTIFIED

Name:

EXT:

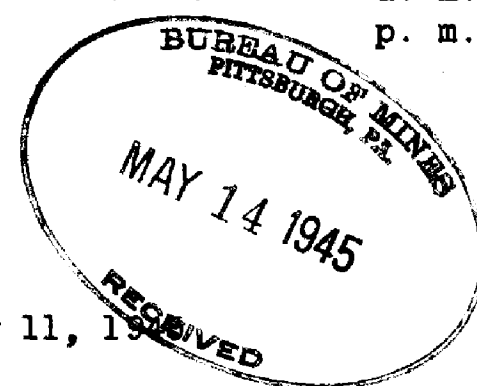
Rm:

UNITED STATES  
DEPARTMENT OF THE INTERIOR

TELETYPE MESSAGE

Form No. 1-1027  
(April 1943)

Sent: a. m.  
p. m.



BUREAU: Mines

APPROPRIATION:

SEND TO: Mr. E. H. Denny

DATE:

May 11, 1945

E. H. Denny  
Bureau of Mines  
4800 Forbes St.  
Pittsburgh 13, Pa.

The last body (twenty third) recovered this morning from underneath fall 2 left parting; one body recovered late yesterday from underneath fall new 3 left entry. Investigation to be made Saturday; Bird representing Bureau at investigation. Rock dust restricted property damage to area off 2 dip. Washington notified.

*RDR*  
conf. Mr. Denny  
Files

REEDER

0  
BUR OF MINES PG 387 GA PLS

BUR OF MINES SU 89 MAY 14 1250 PM

E H DENNY

EVIDENCE INDICATES ALL POWER OFF IN SLANT ENTRIES INTO 3 LEFT, 2 DIP WHERE EXPLOSION APPARENTLY OCCURRED. FOUNT OF FAULTY SAFETY LAMP, FOUND IN IMMEDIATE EXPLOSION REGION, PROBABLY SOURCE OF EXPLOSION. SAFETY ENGINEER, FOUND IN IMMEDIATE FACE REGION, WAS APPARENTLY CHECKING VENTILATION AS HIS ANEMOMETER WAS FOUND WITH BODY. HIS ASSIGNED SAFETY LAMP WAS FOUND NEAR PARTING ON 2 DIP, OVER THOUSAND FEET FROM SCENE. THEREFORE HE MAY HAVE BORROWED THE DEFECTIVE LAMP. BIRD ASSISTED STATE INSPECTORS, MINE OFFICIALS AND MINERS COMMITTEE ON INVESTIGATION SATURDAY. NO DEFINITE CONCLUSION REACHED BUT DEFECTIVE LAMP OBSERVED BY BIRD LX HAD BEEN OVERLOOKED AND DID NOT ENTER INTO EVIDENCE OBSERVED BY COMMITTEE. FAULTY LAMP WAS SHOWN TO DISTRICT LABOR REPRESENTATIVE, OPXX OPERATORS AND STATE MINE INSPECTORS AFTER INVESTIGATION. ALL AGREED THAT LAMP WAS MOST LIKELY SOURCE AND REQUESTED TEST BE MADE. FOUNT OF LAMP SENT TO PITTSBURGH.

BIRD, ODENDAHL AND REEDER LEAVING FOR MINE TUESDAY TO MAKE FURTHER INVESTIGATION

REEDER

END ACK PLS BR

V

MEGD RECD OK END ED

V



GK37 45 4 EXTRA DUPLICATE OF TELEGRAM TELEPHONED

SALT LAKE CITY UTAH MAY 9 1114P

E H DENNY

US BUREAU OF MINES

GAS EXPLOSION IN SUNNY SIDE NUMBER ONE MINE UTAH FUEL

COMPANY WEDNESDAY EVENING 26 MEN IN EXPLOSION AREA

FOUR BODIES RECOVERED BY 9 PM NEWS OF EXPLOSION

HEARD OVER RADIO MCCREARY BIRD ODENDAHL AND I

LEAVING FOR SUNNY SIDE WASHINGTON NOTIFIED

R D REEDER

906A

26 9 ODENDAHL.....