PRELIMINARY REPORT OF GAS EXPLOSION OF MAY 29, 1931, IN THE RICHARDS COLLIERY, SUSQUEHANNA COLLIERIES COMPANY, NEAR MT. CARMEL, NORTHUMBERLAND COUNTY, PENNSYLVANIA

By

S. P. Howell,
Explosives Engineer

DEPARTMENT OF COMMERCE
BUREAU OF MINES

PRELIMINARY REPORT OF GAS EXPLOSION OF MAY 29, 1931, IN THE RICHARDS COLLIERY, SUSQUEHANNA COLLIERIES COMPANY, NEAR MT. CARMEL, NORTHUMBERLAND COUNTY, PENNSYLVANIA

By S. P. Howell

Introduction:

This explosion was of a body of gas at and near the face of No. 38 breast, 174 feet above the monkey heading which apparently accumulated because of a derangement of the ventilation. The means by which this gas was ignited has not been definitely established by the writer, but with the evidence now available it seems probable a blown-out shot of high explosive - probably the permissible branded explosive Red HCLF - ; or by the electric current used for firing the shot; or by incandescent smoking material - cigarettes, lighted match.

The explosion occurred about 12:20 p.m., Friday, May 29, 1931, on the day shift.

Ventilation:

Near the place of origin of the explosion there are four active breasts working, 38 to 41 inclusive. Because of a faulted section there are no breasts between Nos. 35 and 38. The air enters the gangway to No. 43 chute, hence to the monkey heading, and then toward the face of No. 38 breast, it being directed or coursed through the last open heading between the breasts and is directed toward the face of each breast by means of wooden brattice with canvas brattice near the face. From breast 38 the air returns to the monkey heading, passes through headings to No. 35 breast, from 35 breast through the top headings to 33 breast, then through a hole to the gangway at the

level above. It was near the portal of this hole into this gangway of the shaft level that the coal had sloughed off, from the pillar above that gangway, restricting the return air. The firebosses' marks at this hole on the top round were dated, that is, the more recent ones, 5-2, 5-13, 5-29, and 5-30. The fireboss had visited this place the morning of May 29, and there was no impediment to the ventilation there then.

The miners from 39 breast were returning by the way of 41 chute after eating their lunch on the gangway at the time of the explosion, and neither were injured, but it is rumored that they exchanged information with the miners of No. 38 breast, both of whom were killed, just before the lunch hour to the effect that there was gas in both places.

The Location of the Section:

Breasts and chutes, numbered 38 to 41 inclusive, are off of the east gangway off the No. 12 slope off the shaft level in the No. 4 (Little Buck) seam on the North Dip. Coal averages about four feet thick, has a pitch varying from 20 to 28 degrees, and all of these working places are considered gassy.

General Information:

The only electricity entering or used in this section is that which is provided by the Schaffler system 10 hole capacity, and the Hercules Midget 5 hole capacity blasting units. Atlas No. 6 electric blasting caps with six foot copper legs are used, and these legs are shunted. In coal the permissible explosive Red HCLF in 1½ by 8 inch cartridges is used, and in rock at the face of the gangway

60 per cent gelatin dynamite in 1¼ by 8 inch cartridges is used. Individual miners use the permissible Wheat electric mine lamp while the pair of miners in each breast have one permissible Kohler flame safety lamp magnetically locked. Supervisory officials all carry the same kind of flame safety lamp.

Occasionally a miner who is under suspicion or a miner selected at random is thoroughly searched for matches and smoking material, and it is reported that on the morning of May 29, 1931, a search disclosed matches in the possession of a miner and he was disciplined by being discharged.

Flame safety lamp No. 8 found on the steps of the manway of No. 38 breast, 15 feet from the face, indicated by visual inspection that it was in first-class condition.

Safety lamp No. 74 which was found near the face of No. 40 breast showed by visual inspection that it was in first-class condition. The management are willing to have these two lamps sent to Pittsburgh for lamp box test, but this apparently is entirely superfluous.

One miner working in 40 breast was drilling a hole in the east rib, the collar of this hole being about 8 feet from the face. This hole was in about 8 inches. This position of the man was almost directly opposite the second heading through pillar 39½. He was killed by being thrown violently against the rib. He was not burned. The other miner in the breast was somewhat lower in the breast and was near the sheet-iron slide. At the time of the explosion he threw himself on this slide, and slid about a hundred and forty feet down

it to the gangway. He was not seriously injured.

One miner from No. 38 breast was found on the left (east) rib of No. 39 breast with most of his clothing blown off, and severe wounds from violence. His clothing bore evidence of burns. He was evidently killed instantly. It seems probable that this miner was perhaps standing in the top heading in pillar 38½, and received the full force of the explosion from No. 38 breast.

The other miner from 38 breast was found along the right (west) rib of No. 39 breast just outby the corner of this rib with the top heading. His clothing bore evidence of burns but he did not show evidence of much violence.

The miners in 41 breast were uninjured and it is reported that neither they nor the miner who survived from No. 40 breast saw any flame.

Two shot-firing units were found along the left (east) rib of No. 39 breast, one of them-the Schaffler system-was badly indented on the outside as though it had been projected violently, possibly from the top pillar heading in 38½ pillar.

After the explosion there was discovered in this heading two 25 pound cases of Red HC L.F. permissible explosive, and neither the cartridges nor the boxes showed evidence of extreme violence. There was likewise some electric blasting caps lying loose between the boxes after the explosion. There was no evidence of a carton near by. On the low side of this heading strands of hair were found as though a man had been violently skidded along this lower side of the heading.

The force of the explosion entered the gangway through No. 38 chute with great violence and fatally injured two men who were loading a car at that chute, a driver and a loader.

On the gangway about fifteen feet outby No. 38 chute four men were eating lunch. They were not seriously injured. They were the three gangway miners and a loader.

It is not yet established as to who owned the Schaffler system battery but if it were owned and used by the miners in 38 breast, it could not have been projected where it was found unless it was suspended, or held, somewhere in the top heading through 38½ pillar. On the other hand I am assured that if the miners had fired a shot at the face of No. 38 breast that their safety lamp would not have been found so near the face of that breast.

At the face of No. 38 breast near the center of the breast was a 15 inch socket (bootleg) of a hole which had obviously been drilled in such a way that it had no chance to break the coal properly, and was obviously liable to blow out.

Fatalities:

There were five fatalities, the two miners from No. 38 breast who were found in No. 39 breast, one miner in No. 40 breast, and a driver and a loader on the gangway.

Rescue Work:

The driver was killed instantly on the gangway; the loader was very severely injured and died in about twelve hours at the hospital. His was the only hospital case. Three bodies in the breasts were

recovered by 6 o'clock Friday evening, May 29, in advance of fully restored ventilation by four men wearing McCaa Self-Contained Mine-Rescue Breathing Apparatus.

Foreman Miner Jesse Henson assisted in the investigation which was made on June 4, 1931.

Air Samples Taken:

The following mine air samples were taken: No. 718 at the face of No. 41 breast; No. 575 at the face of No. 40 breast; No. 717 at the face of No. 40 breast (it is possible that this sample is a "dud" because the bottle did not sizz when the tip was broken); No. 573 at the face of a blind heading off No. 39 breast (this was the only place where the safety lamp showed any evidence of gas. The flame of the lamp went out); No. 574 at the face of No. 39 breast; and No. 576 at the face of No. 38 breast.

Members of the Inspection Party Made June 4, 1931:

A trip into the explosion area was made by the following representatives of the Susquehanna Collieries Company: Mr. R. C. Penman, mine foreman, Richards Colliery; Mr. George E. Cleaver, general inside foreman, Richards and other collieries; Mr. C. H. Brehm, supervisor of safety and compensation, Wilkes-Barre, Pa.; and Mr. C. E. Billman, inside foreman at the Cameron Colliery but temporarily assigned to the Richards Colliery, and the following representatives of the U. S. Bureau of Mines: Mr. Jesse Henson, foreman miner, and Mr. S. P. Howell, explosives engineer.

Respectfully submitted,

S. P. HOWELL,
Explosives Engineer.

FINAL REPORT OF EXPLOSION OF MAY 29, 1951, RICHARDS COLLIERY, SUSQUEHANNA COLLIERIES COMPANY, NORTHUMBERLAND COUNTY, PENNSYLVANIA

By

S. P. Howell,
Explosives Engineer

DEPARTMENT OF COMMERCE
BUREAU OF MINES

C O N T E N T S

FINAL REPORT OF EXPLOSION OF MAY 29, 1931, RICHARDS COLLIERY, SUSQUEHANNA COLLIERIES COMPANY, NORTHUMBERLAND COUNTY, PENNSYLVANIA

By S. P. Howell

INTRODUCTION

This was a gas explosion in 38 breast, east north dip gangway, No. 4 vein, No. 12 slope, shaft workings, Richards Colliery, Shamokin Division, Susquehanna Collieries Company, near Mt. Carmel, Northumberland County, Pa., which occurred about 12:20 p.m. on May 29, 1931.

There were fourteen men in the section at the time of the explosion, four of whom were killed outright, one succumbed about twelve hours after the explosion from the effects of violence, and nine were uninjured.

None of the uninjured men were imprisoned, or their lives placed in serious jeopardy by the explosion.

The fatally injured are listed in Appendix B.

The accident was caused by accumulation of a body of gas probably caused by a fall or slipping off of a mass of coal which in turn partially closed an air hole outby 38 breast. The ignition of this gas was probably simultaneous with a blown-out (or windy) shot of a permissible branded explosive used in a non-permissible manner. The ignition may have resulted from the flame of the explosive or from the arc or spark from the current from a Schaffler system 10-hole capacity, shot-firing unit. It is remotely possible that the ignition may have been caused by incandescent smoking material, though no direct

evidence was adduced to substantiate this.

The effect of the explosion was localized in 38, 39, and 40 breasts and on the gangway at and near 38 and 39 chutes.

This explosion was investigated by the writer and Mr. Jesse Henson, foreman miner, U. S. Bureau of Mines, in company with officials of the Susquehanna Collieries Company on June 4, 1931, and subsequently by the writer.

LOCATION

The Richards Colliery is near Mt. Carmel, Mt. Carmel Township, Northumberland County, in the West Mahanoy district of the Western Middle Anthracite Coal Field of Pennsylvania, and is served by railroad connection with the Pennsylvania Railroad.

The Richards Colliery is operated by the Susquehanna Collieries Company, P. O. Box 427, Wilkes-Barre, Pa.

The principal officers of the Susquehanna Collieries Company with whom the writer made contact are: Mr. C. A. Gibbons, general manager, Wilkes-Barre, Pa.; and Mr. William Watkins Williams, district superintendent, Shamokin Division, Shamokin, Pa.

PRODUCTION AND EMPLOYEES

In 1930 the entire colliery produced about 600,000 short tons of coal, worked 285 days, and employed 1096 men. The average daily production in May, 1931, was 2172 short tons.

This section of the colliery - east gangway, No. 4 vein, No. 12 slope, shaft workings - produces an average of about 70 tons per shift (2,000 pounds) of which about 85 per cent is coal.

In this section there are about 17 employees including super-

visory officials.

THE MINE

The production of the Richards Colliery comes from three separate units - the Richards slope, the Richards shaft, and the water level tunnel.

The section in which the explosion occurred is reached by a 900-foot shaft, a short gangway or tunnel, a 20°, 290-foot slope, and the east gangway in some 2000 feet.

This east gangway is in the No. 4 (Little Buck) vein, north dip.

The section from breast 38 to 41 is considered very gassy, and no power-driven equipment is used for mining here.

THE COAL BED

The coal in the No. 4 vein is anthracite, averages four feet thick, and dips northerly, in the section involved, from 20 to 28°. One inch from the bottom there is a band averaging about three inches thick. The roof is a black sandstone which requires timbering. It is several feet thick. The floor is a hard, black sandstone, having a smooth surface.

METHOD OF MINING

The breast and pillar method of mining is used and the chutes are normally placed on 50-foot centers but because of local irregularities in the vein in the section affected by the explosion, this placement of the chutes and other dimensions did not conform closely. The gangways are twelve feet wide; the monkey headings and other headings six feet wide; the breasts twenty-four feet wide, and

the breast pillars twenty-six feet thick. About 40 per cent of the coal is extracted in advance work, of which all is recovered.

The coal is mined at the face by blasting and hand pick work. Pillars are not now being extracted in this section. No mechanical loaders or conveyors are used, but because of the pitch and the use of sheet iron slides, the coal slides or is easily puched to the gangway.

There are systematic timbering rules which bear evidence of enforcement. There are three lines of props in the breast, spaced 6 feet apart, and the posts in each line of props are spaced 6 feet. Cap pieces one to two inches thick, two feet long, are generally used on the props in the breasts. Monkey headings and other headings are generally posted on the high side, the posts being spaced about six feet apart.

VENTILATION AND GASES

The section of the mine in which the explosion occurred is rated as gassy; is known to produce considerable gas; and care was taken to see that the air was conducted to the face of all breasts.

The ventilation was conducted in the manner shown in Appendix A of the map of this section of the mine, and was in the east gangway to the face of the gangway through 43 chute, back the monkey heading, to the face of breasts No. 41, 40, 39, and 38, back to the open heading to breast 36, then through the top heading and the monkey heading from breast 36 to breast 35, to the face of breast 35 through the top headings to the top of breasts 34 and 33, then through an air hole

into the east north dip gangway in the No. 4 vein, shaft level, at which point it split and returned to the surface through numerous inactive and other workings.

Special attention is directed to the vent where this air hole enters the east dip gangway, shaft level, for it is here that the loose coal from a pillar above this point, broke off and slid into this air hole, and blocked, at least partially, the return air at this point, thereby substantially reducing the ventilation of the affected area, and permitting the accumulation of a body of explosive gas. Since this point was visited early on May 29, by the fire boss and was reported clear, it may be concluded that this fall and slide of coal occurred sometime before noon of May 29, though this is not certain.

This area was ventilated by an 8-foot Connellsville force fan, while the west split of the exhaust from this east gangway was equipped with a Jeffries exhaust fan. The Connellsville fan is electrically driven. There was said to be no reserve motive power for this fan. It is located outside and the volume of the air in the main intake aggregated 80,000 cubic feet per minute. The air entering the east gangway No. 12 slope was from one of ten main splits. The air returning to the east gangway of the shaft level from the affected area measured 3,350 cubic feet per minute on May 19, 1931. The fan is inclosed in a steel housing with the motor in a near by brick building. The fan is equipped with explosion doors and the air may be reversed by door adjustment. The fans are run continuously and not slowed down. The water gauge on the Connellsville fan is plus 1.2