

FINAL REPORT
PRAGO NO. 7 - ROOF FALL
ALABAMA BY-PRODUCTS CORPORATION

By

Frank E. Cash

Introduction:

At 8:10 A.M. Friday, July 1, 1938, a roof fall occurred on $1\frac{1}{4}$ south wall in Prago No. 7 Mine, Alabama By-Products Corporation, Prago, Alabama, trapping nine men, three of whom were rescued alive, severely shocked, with minor injuries, one rescued alive, died, probably from shock, enroute to the surface, and the remaining five bodies were dead when recovered. In addition to the above nine men, two other men on the wall near the entry escaped uninjured.

Prago No. 7 Mine:

Type - Slope $1\frac{1}{4}$ miles deep, 2° to 10° dip.

Coal Bed - Mary Lee, 40-inch roof to floor, 6-inch rock 18-inches from roof, 300-foot average cover present workings.

Roof and Floor: Floor, hard smooth shale. Roof, immediate, 4 to 10 feet, sandy slate with numerous slips, main roof slaty sand and sandstone in alternate layers of varying thicknesses.

Production and Employees: The mine operates two shifts per day with 219 loaders and 132 day men on the two shifts, and produces 1400 to 1600 tons per day.

Method of Mining: A slope with right and left air courses driven down the dip in coal with room or wall entries turned right and left 300 to 400 feet apart. Rooms are turned on 100-foot centers driven 50 feet wide and 210 feet deep. During the past few years various width places were driven pointing to long wall work. During 1938, three walls 250 feet deep have been developed.

Features and Practices: Gassy - State Mining Department.

Lamps: Edison electric cap for all employees, and magnetically locked permissible flame safety lamps for testing purposes.

Dust: Small quantities treated with rock dust, rooms, entries and walls.

Cutting: Short wall non-permissible machine, 6-foot cutter bar.

Explosives: Permissible, electric detonators, and clay stemming.

Haulage: Slope, rope; rooms and walls, electric trolley locomotive.

Watering: Sprays 400 feet apart on main slope, first one-half mile down from surface.

Exhaust fan: 113,000 cu.-ft. per minute at 2.8-inch water gage, split and continuous, ventilates the mine.

Details of Disaster:

Fourteen south wall had a face 260 feet wide, and had retreated 153 feet. The timbering was split timbers 8 to 12 square inches area set with wedges 4 feet centers parallel to the face and a cut (approximately 6-foot centers in the direction of retreat.)

Very little or no weight had been noticed except in a small area 50 or more feet back from the face May 20th, until about 12 Noon, Thursday, June 30th, while, during the process of cutting, the wall roof began to work and take weight. The machine crew cut the remaining 50 feet of face after movement began and before the first fall occurred.

The first fall began working about noon, the major part fell about 2 P.M., and was quiet at 4 P.M. (See sketch.) This fall was rectangular in shape and fell angular to the face, leaving about half of the mined out area roof standing with little or no weight evidenced.

The fall reached the face, caught 100 feet of the conveyor, from 60 feet from upper end to 90 feet from lower end of wall. Between 5 and 11 P.M. Thursday the Assistant Superintendent, J. I. Wingard (deceased), Frank Sparks, Night Mine Foreman, and others, went in on the wall, removed the tail pan from upper end of wall to lower end, against fall, set 4 rows of additional timbers back of the conveyor and 6 additional timbers around the tail pan of the conveyor.

They then shot 40 feet of the 90 feet on the lower end of the wall, ran the conveyor to clear the pan, and shot the remaining 50 feet next to the entry, set 6 timbers, which were knocked out by the shot, and ran the conveyor to clear the pan. Being satisfied with the condition of the wall, they went to the surface at about 11 P.M. Thursday, June 30th. The fire boss made the wall at 2 A.M., July 1st, and gave instructions to re-examine the wall before work was begun.

On Friday, July 1st, the wall crew of 12 men reached the wall area about 6:45 A.M., the wall¹¹ was examined by a certified man and the crew given "OK" to begin work. ←

The wall was quiet, the crew went to work, the Assistant Superintendent came in on the wall, sent two men off to another wall, one trip of 12 cars had been loaded, and the crew was loading on 2 empty cars which were left at the conveyor beam, when the second, or disastrous fall came at 8:10 A.M. Friday, July 1st.

Rescue and Recovery:

Rescue and recovery were started immediately by the men in the mine, and the Superintendent, General Office, State Mining Department and the Bureau of Mines were notified by telephone.

Messrs. Cash and Saxon were in Piper No. 2 Mine, 30 minutes from the surface and 90 miles away from Praco when the call reached them at 10:10 A.M., but left Piper at 11:00 A.M., and arrived at the scene of the accident at 1:00 P.M.

Rescue and Recovery was accomplished by loading the fresh shot of coal and timbering rock and coal between the conveyor and coal, since all 9 men, except one, were between the conveyor and the face when the second fall came, apparently without warning.

1. Friday, 10:00 A.M. - Loyd Painter, dead, 26 feet from center line of track up wall.
2. Friday, 11:45 A.M. - Leonard Dockett, dead, 33 feet up wall.
3. Friday, 12:45 P.M. - Carl Shackelford, alive, 33 feet up wall.
4. Friday, 3:45 P.M. - Willard Elmore, alive, 42 feet up wall.
5. Friday, 4:00 P.M. - Gurlous Hyehe, alive, 42 feet up wall. on top of fall.
6. Saturday, 1:30 A.M. - J. D. Painter, alive, died on way to surface, 65 feet up wall.
7. Saturday, 2:30 A.M. - J. W. Peffer, dead, 57 feet up wall.
8. Saturday, 8:15 A.M. - J. I. Wingard, dead, 26 feet up wall to right of conveyor.
9. Saturday, 5:30 P.M. - Howard Morgan, dead, 75 feet up wall.

Maps:

The attached maps or sketches were made and furnished by the engineering department of the operating company.

Summary:

These conclusions are based on observations made and information obtained during the rescue and recovery and during the investigation completed July 7th, 1938, by Cash and Saxon.

The investigation was concluded by the following:

Alabama By-Products Corporation:

J. W. Porter, President
P. H. Haskell, General Manager
W. C. Chase, General Superintendent
John W. Hager, Superintendent, Praco
E. M. Barnes, Mine Foreman, Barney
Frank Sparks, Night Mine Foreman, Praco
G. V. Simpson, Safety Director

State Mining Department:

W. E. Hillhouse, Chief Inspector
James Nicol, Associate Inspector
James Johnstone, Associate Inspector
W. C. Chapman, Associate Inspector

U. S. Bureau of Mines:

Frank E. Cash
G. E. Saxon

There had been one fall on the wall June 30, 1938. It had been decided that when any trouble was encountered on the wall, they would move ahead, leaving a 15 to 25-foot coal pillar, drive an upset and develop the wall further with the coal pillar for protection. Instead of following this procedure, feeling that the work was safe, they were going to slab up the wall, pass the fall, and continue the wall.

There were three similar walls in progress in the mine, but no general falls had been experienced.

The rock broke on the coal face, on four cribs which were set along 14 south entry and on a 25-foot coal pillar on 13 so

The wall had been worked 153 feet with no additional protection for the wall crew except the small timbers set on 4-ft. by 6-ft. centers (some irregular.)

The production, cost and safety experience in the mine during 1938 had been much better than in previous years. Cooperative first aid training of 877 men on a 100 percent basis was completed for the Fraco No. 7, 7 $\frac{1}{2}$ and 10 Mines, June 28th. An Accident Prevention Course is being conducted for Fraco Mines with all officials and supervisors attending.

Cash had been in Fraco No. 7, 14 south wall about 60 days prior to the disaster.

The general feeling between men and management had been markedly improved during the past year.

At the request of John W. Porter, President, Alabama By-Products Corporation, the Bureau sent C. A. Herbert and A. L. Toenges, who were accompanied by Cash and Saxon, to advise with the operating company relative to the future safe procedure on wall or long face work in Fraco. A copy of Messrs Herbert and Toenges report is attached.

Conclusions:

From the available information, contributing to the fall and disaster, were:

1. Lack of experience with long wall work in Peace No. 7 Mine.
2. No established definite method of procedure in the event of roof movement.
3. Inadequate support from back or gob side of conveyor to face of wall.
4. Over-anxiety to make the wall work successful, economical and efficient.

Recommendations:

The following recommendations for continued wall work on the present plan, based on the observations made and information obtained, hind-sight rather than fore-sight, will make wall work in Frase No. 7 Mine safer, and help to prevent similar future disasters.

1. The length of slab paralleling the entry outby the wall face for machine parking and timber storage should be reduced to not over 30 feet, and a row of round timbers not less than 5 inches at the small end, set with headers, not over 6 feet apart.
2. A line of 6-ft. by 6-ft., 3-piece, rock-filled cribs, 6 feet apart, should be maintained on the wall side of the entry inby the conveyor.
3. Two lines of 4-ft. by 4-ft., 3-piece timber cribs on 8-foot centers parallel to the wall face and 12-foot centers perpendicular to the wall face should be maintained behind the conveyor, the first line against the conveyor, and the second line 6-ft. centers back of the first. The back line to be removed and set against the conveyor as it is moved forward, or as the face advances.
4. When a wall begins to show any appreciable weight or when the retreat reaches 125 feet, the lines of breaking timbers or cribs and a 15 to 25-foot pillar of coal should be left, and a new upset driven and wall development resumed.
5. By experimenting with a worked-out area so left, additional knowledge and experience should be gained, and such experience profited by on operating walls.
6. An experienced wall foreman should be employed or put on the walls, whose duties will be to closely supervise only the wall work.
7. Until additional knowledge concerning roof action is obtained, a definite set of rules should be formulated and enforced governing procedure when a wall shows indications of roof movement.
 - (a) Cease all operations and leave wall immediately.

- (b) No work should be done on the wall while it is chipping, working or falling, except for observation purposes.
 - (c) Work should not be resumed until at least 48 hours after the movement ceases, roof falls, or wall becomes quiet.
 - (d) At the end of the 48 hours, a thorough examination should be made by the responsible operating officials from which a decision should be reached concerning resumption of work on the vacated face or leaving a coal pillar and driving a new upset.
 - (e) Future work and experience should govern the continuation or changing of any set of formulated rules.
8. For future wall work, consideration should be given to a change in development that would put the wall face more nearly perpendicular to existing slip planes in the immediate roof.

Acknowledgements:

The Bureau of Mines' representatives wish to express their appreciation to the officials and employees of the Alabama By-Products Corporation and to the Alabama Inspection Department for the assistance and information given and courtesies extended during the investigation of this accident.

Yours very truly,

Frank E. Cash

Frank E. Cash
District Engineer.

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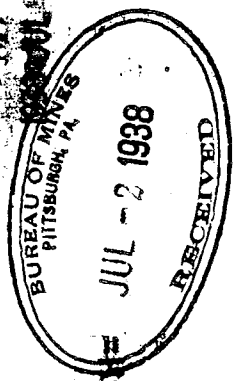
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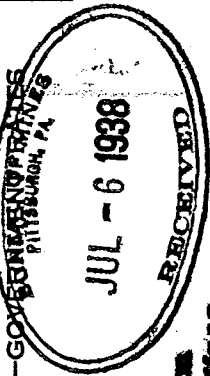
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