MAI-2009-12

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION
Metal and Nonmetal Mine Safety and Health

REPORT OF INVESTIGATION

Underground Nonmetal Mine
(Salt)

Fatal Fall of Roof Accident
June 20, 2009

Morton International Inc.
Weeks Island Mine & Mill
New Iberia, Iberia Parrish, Louisiana
Mine ID No. 16-00970

Investigators

David B. Hamm
Mine Safety and Health Specialist

Laurence M. Dunlap
Supervisory Mine Safety and Health Inspector

Paul L. Tyrna
Geologist

Originating Office
Mine Safety and Health Administration
South Central District
1100 Commerce Street, Room 462
Dallas Texas, 75242-0499
Edward E. Lopez, District Manager

OVERVIEW

Carlton J. Pennier, Oiler/Greaser, age 52, was fatally injured on June 20, 2009. Pennier was cleaning equipment when the mine roof fell on him. The fall was about 50 feet long by 20 feet wide and up to 3 feet thick. Another miner working nearby was not injured.

The accident occurred because the ground support system for the mine was not designed, installed and maintained to control the ground where persons worked or traveled. The roof rock broke below the anchorage zone of the roof bolts and pulled several of them out of the roof leaving the expansion shells in the bolt holes.

GENERAL INFORMATION

Weeks Island Mine and Mill (Weeks Island), an underground salt mine, owned and operated by Morton International Inc. was located near New Iberia, Iberia Parish, Louisiana. The principal operating official was Daniel A. Schmit, Facility Manager. The mine operated three 8-hour shifts per day, 5 days per week. Total employment was 160 persons.

Salt was drilled, undercut, and blasted underground utilizing a room and pillar mining method. Broken salt was transported by belt conveyor to a vertical shaft where it was crushed and then hoisted to the surface. Crushed salt was sold for a variety of commercial uses.

The last full regular inspection at this operation was completed on March 19, 2009. A regular inspection was ongoing at the time of the accident.

DESCRIPTION OF THE ACCIDENT

On the day of the accident, Carlton J. Pennier (victim) reported for work a few minutes before his usual starting time of 7:00 a.m. Pennier and Stephen Rivet, Oiler/Greaser, entered the mine and met Tras Lasseigne, Maintenance Foreman, at the shop. Lasseigne directed them to service equipment on the 1200 level of the mine.

Pennier and Rivet completed their work on the 1200 level and went to the maintenance lunchroom at 11:00 a.m. After lunch, Lasseigne instructed Pennier and Rivet to wash a face drill located at the 12B intersection on the 1500 level of the mine.

Pennier and Rivet traveled to the 1500 level on separate mine tractors. Pennier pulled a 16-foot trailer loaded with high pressure washing equipment. They arrived on the 1500 level then moved the drill from the 12B intersection to the 11B intersection because it would have been unsafe to use the washer near the 480-volt transformer located at the 12B intersection.

At 12:30 p.m., Pennier and Rivet began washing the drill. About 30 minutes later, they heard a popping sound and thought the noise was coming from the elevated boom on the drill as the hydraulics bled off. They heard a second popping sound a few minutes later but again thought the noise was coming from the drill boom.

By 1:20 p.m., Pennier and Rivet had emptied the water tank on the trailer. They stood between the drill and the trailer for a few minutes to roll up the hoses. Rivet stepped over the trailer hitch and walked a few feet while continuing to roll up additional hose that extended beyond the trailer. He heard two loud noises and felt a rush of air. Rivet turned and saw that the roof had fallen, covering most of the area where the drill, tractor, and trailer were parked.

Rivet called for Pennier but the victim was not responsive. Rivet drove to the nearest mine phone to call for help. Derek Christian, Production Foreman, heard the distress call at 1:30 p.m. and initiated mine emergency procedures.

The Mine Safety and Health Administration (MSHA) was notified of the accident at 1:45 p.m. by a telephone call from Daniel Schmit, Facility Manager, to Maria Rich, Supervisory Mine Safety and Health Inspector. Fred Gatewood, Assistant District Manager, was notified. An order was issued under the provisions of section 103(k) of the Mine Act to ensure the safety of the miners.

At 2:40 p.m., management submitted a rescue plan that was reviewed by MSHA. Miners looked for Pennier between the drill and the tractor, where he was last seen, but could not locate him. George Olivier and John Ramirez, Mine Safety and Health Inspectors, arrived at the mine at 3:15 p.m. Olivier monitored activities on the surface while Ramirez joined the rescue effort underground.

A mechanical scaler was used to scale the crosscut from the 11C intersection to the 11B intersection and the drill was pulled from the fall. A front-end loader was used to remove part of the fall. Pennier was located at 5:36 p.m. and transported to the surface where he was pronounced dead by the Iberia Parrish coroner at 8:22 p.m. Death was attributed to crushing injuries.

INVESTIGATION OF THE ACCIDENT

MSHA's accident investigation team traveled to the mine on June 21, 2009, conducted a physical inspection of the accident scene, interviewed employees, and reviewed documents and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management, employees, and miners' representatives.

DISCUSSION

Location of the Accident

The accident occurred at the 11B intersection on the 1500 level of the mine. The area of the accident was relatively level.

Weeks Island

Weeks Island was located in a salt dome about 9,000 feet in diameter and 20,000 feet from top to bottom. Several mining levels in the dome were designated by their approximate depth from the surface. Salt was mined on the 1400 level and the 1500 level at the time of the accident. Previous mining had taken place on several higher levels. Mine development entries and crosscuts were driven on 210-foot centers and were approximately 55 feet wide and 22-25 feet high. After development, each level was

benched to a total height of 75 feet. Benching had not yet taken place on the 1500 level where the accident occurred.

Roof Fall

The roof fall occurred at the intersection of entry 11 and crosscut B on the 1500 level (see Exhibit B). The fall zone extended from the southeast side of the intersection into the crosscut several feet toward the intersection of entry 11 and crosscut C. The section of roof that fell was about 50 feet long by 20 feet wide and up to 3 feet thick.

The roof around the fall cavity, especially on the 11C side, showed diffuse brown staining that was most obvious where a mechanical scaler had raked the roof and ribs. The staining occurred in small localized areas throughout the 1500 level.

Ground Support System

Ground control at Weeks Island consisted of mechanical roof bolting. Development areas were initially provided with two rows of bolts installed on 5-foot centers in the middle of the entries. Bolts were installed to within 80 feet of the faces. A full pattern of bolts on 5-foot centers was later provided along all beltlines and travel ways.

The roof bolts in intersection 11B were installed more than one year prior to the roof fall. At that time, miners reportedly used a Canon roof bolter to drill 1 3/8-inch holes and install Jenmar 5/8-inch diameter, 6-foot long, grade 60 roof bolts with Jenmar D1L expansion shells.

Several roof bolts pulled out of the overlying strata with the rock that fell in the area of the accident, indicating poor bolt anchorage. Poor anchorage of a mechanical bolt can occur for several reasons, including oversized bolt holes, over spinning the bolt, too much or too little torque, or weak rock at the anchorage horizon.

The investigators could not determine how many of these factors contributed to the roof fall. However, they did determine that torque test records indicated that roof bolt installers had not checked installation torque of a sufficient number of roof bolts (first, every tenth, and last) at the time the area was bolted. Additionally, they were recording 150 foot-pounds of torque for every roof bolt installed and tested.

Training and Experience

Carlton Pennier had 25 years of experience, all at this mine. He had 16 weeks of experience as a greaser and had received all training as required by 30 CFR Part 48.

Stephen Rivet had 29 years of experience, all at this mine. He had 1 year of experience as a greaser and had received all training as required by 30 CFR Part 48.

ROOT CAUSE ANALYSIS

A root cause analysis was performed and the following root cause was identified:

Root Cause: Roof bolts were not properly installed in the area of the roof fall.

Corrective Action: The entry and crosscut leading into the fall area were scaled and additional roof bolts were provided as necessary. Miners were instructed to test the installed torque of the required number of roof bolts each shift. Management will monitor roof bolting operations to ensure that roof bolts are properly installed and torqued.

CONCLUSION

The accident occurred because the ground support system for the mine was not designed, installed and maintained to control the ground where persons worked or traveled. The roof rock broke below the anchorage zone of the roof bolts and pulled several of them out of the roof leaving the expansion shells in the bolt holes.

ENFORCEMENT ACTIONS

Order No. 7893960 was issued on June 20, 2009, under the provisions of Section 103(k) of the Mine Act:

A roof fall occurred near the 11B intersection on 1500 ft level at this operation on June 20, 2009. This order is issued to assure the safety of all persons at this operation. It prohibits activity one room in each direction from the fall until MSHA has determined that it is safe to resume normal mining operations in the area. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and/or restore the operations to the affected area.

This order was terminated on August 14, 2009, after conditions that contributed to the accident no longer existed.

Order No. 7875340 was issued on July, 1 2009, under the provisions of Section 104(d)(1) of the Mine Act for a violation of 30 CFR 57.3360:

A fatal accident occurred at this operation on June 20, 2009, when a miner was fatally injured by a fall of roof while power washing a drill. Management engaged in aggravated conduct constituting more than ordinary negligence in that they knew that their ground support system had not been properly designed, installed, and maintained. This was an unwarrantable failure to comply with a mandatory standard.

This order was terminated on August 14, 2009. The operator scaled and installed additional roof bolts in the entry and crosscut leading into the fall area. Miners were instructed to test the installed torque of the required number of roof bolts each shift. Management will monitor roof bolting operations to ensure that roof bolts are properly installed and torqued.

Order No. 7875345 was issued on September 14, 2009, under provisions of Section 104 (d)(1) of the Mine Act for a violation of 57.3203(f)(2):

A fatal accident occurred at this operation on June 20, 2009 when a miner was struck by material which had fallen from the roof while he was power washing a drill. The miner was working under ground that had been supported by conventional tensioned rock bolts. The torque on the first, tenth and last roof bolt had not been determined as evidenced by documentation provided during the investigation. Management engaged in aggravated conduct in its failure to ensure that rock bolts, installed as sole ground support, were tested to ensure their effectiveness. This violation is an unwarrantable failure to comply with a mandatory standard.

This citation was terminated on September 14, 2009, after the affected area of intersection 11B was scaled and secured with 6-foot roof bolts installed with a minimum torque of 150 foot-pounds.

Approved: _____ Date: _____

Edward E. Lopez
District Manager

LIST OF APPENDICES

APPENDIX A

PERSONS PARTICIPATING IN THE INVESTIGATION

Morton International Inc.

Bruce Blakemore	Safety Supervisor
Jon Graham	Mine Manager
Ray Joseph	Miners' Representative
Michael Resetar	Safety Director

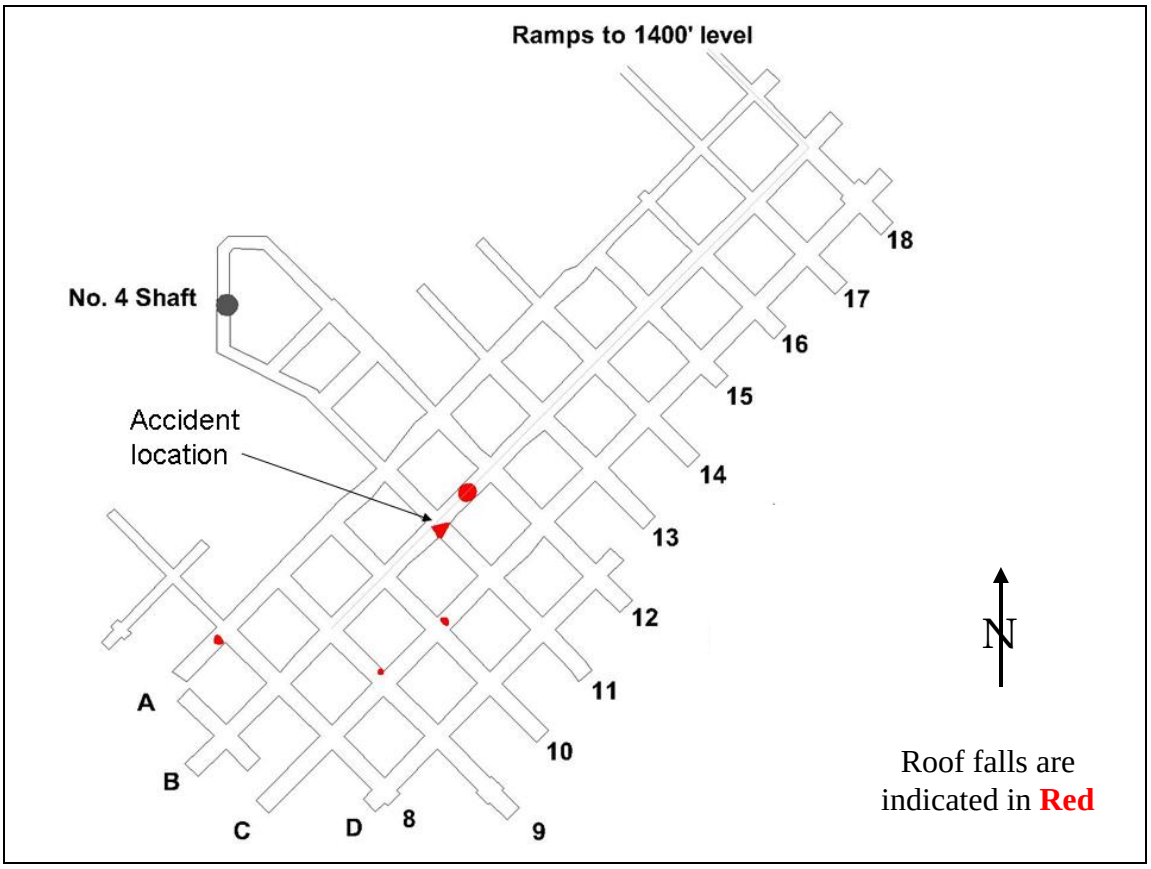
Patton Boggs LLP

Donna Pryor	Attorney

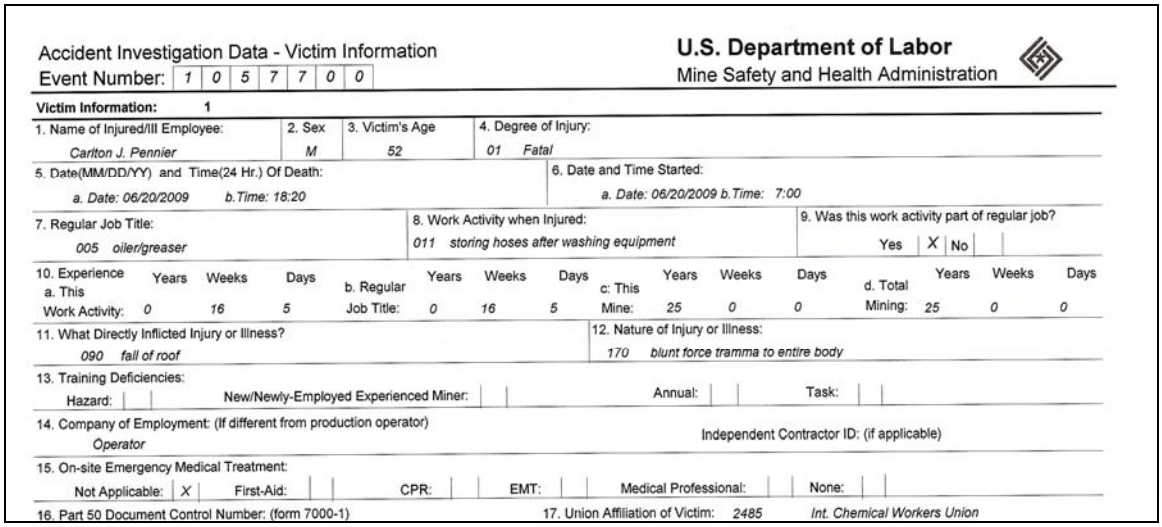
Mine Safety and Health Administration

David B. Hamm	Mine Safety and Health Specialist
Laurence M. Dunlap	Supervisory Mine Safety and Health Inspector
Paul L. Tyrna	Geologist

APPENDIX B


Ramps to 1400' level
No. 4 Shaft
Accident location
18
17
16
15
14
13
12
11
10
9
8
A
B
C
D
N
Roof falls are indicated in Red

APPENDIX C



Accident Investigation Data - Victim Information

Event Number: 1 0 5 7 7 0 0

U.S. Department of Labor
Mine Safety and Health Administration

Victim Information: 1

1. Name of Injured/Ill Employee:	2. Sex	3. Victim's Age	4. Degree of Injury:
Carlton J. Pennier	M	52	01 Fatal

5. Date(MM/DD/YY) and Time(24 Hr.) Of Death:
a. Date: 06/20/2009 b.Time: 18:20

6. Date and Time Started:
a. Date: 06/20/2009 b.Time: 7:00

7. Regular Job Title:
005 oiler/greaser

8. Work Activity when Injured:
011 storing hoses after washing equipment

9. Was this work activity part of regular job? Yes X No

10. Experience

	Years	Weeks	Days
a. This Work Activity:	0	16	5
b. Regular Job Title:	0	16	5
c. This Mine:	25	0	0
d. Total Mining:	25	0	0

11. What Directly Inflicted Injury or Illness?
090 fall of roof

12. Nature of Injury or Illness:
170 blunt force tramma to entire body

13. Training Deficiencies:
Hazard: | New/Newly-Employed Experienced Miner: | Annual: | Task:

14. Company of Employment: (If different from production operator)
Operator

Independent Contractor ID: (if applicable)

15. On-site Emergency Medical Treatment:
Not Applicable: X | First-Aid: | CPR: | EMT: | Medical Professional: | None:

16. Part 50 Document Control Number: (form 7000-1)

17. Union Affiliation of Victim: 2485 Int. Chemical Workers Union