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

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Sand and Gravel)

Fatal Other (Drowning) Accident
March 30, 2007

Martin Marietta Materials, Inc.
Martin Marietta Materials, Inc. Plant #5
Denham Springs, St. Helena Parish, Louisiana
Mine ID No. 16-01406

Investigators

Brian P. Goepfert
Supervisory Mine Safety and Health Inspector

Willard J. Graham
Supervisory Mine Safety and Health Inspector

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

OVERVIEW

Robert L. Spears, dredge operator, age 34, was fatally injured on March 30, 2007, when he fell into a dredge pond and drowned. He was working alone on the dredge deck, possibly attempting to untangle a winch cable. He was not wearing a life jacket.

The accident occurred because management policies and work procedures failed to adequately address the risks associated with working near water. Company policy did not require employees to wear a life jacket while working inside the hand rails provided around the perimeter of the dredge deck. The company did not have a policy or formal procedure relative to working alone on the dredge deck.

Additional considerations that might prevent future accidents include more substantial hand rails on dredges to keep persons from falling into the water, providing hand holds and access ladders on the sides of dredges in case someone needs to climb out of the water, providing life jackets that will upright an unconscious person after they have fallen into the water, and identifying which employees cannot swim so that extra measures of protection can be provided for them.

GENERAL INFORMATION

Martin Marietta Materials, Inc. Plant # 5, a sand and gravel dredging operation, owned and operated by Martin Marietta Materials, Inc., was located in Denham Springs, St. Helena Parish, Louisiana. The principal operating official was Eric Buchanan, plant manager. The mine operated two 12-hour shifts per day, five and one half days per week. Total employment was 13 persons.

Sand and gravel were dredged and pumped from the pit to the processing plant where the materials were screened and sized. The finished product was sold for construction uses.

The last regular inspection at this operation was completed on September 11, 2006.

DESCRIPTION OF ACCIDENT

On the day of the accident, Robert Spears (victim), reported for work at 4:00 a.m., his normal starting time. He traveled to No. 10 dredge and began dredging material alone. About 2:00 p.m., Spears used his cell phone to call Wilson Moore, No. 5 dredge operator. They discussed a number of things, including the problem Spears was having with a mud seam in the pond, until about 2:45 p.m. Moore advised Spears to work through the mud seam as they usually did, by raising and lowering the suction head (with the on-deck cable winch). Spears continued to work, and at some point, the winch cable became tangled on the winch reel.

Investigators believe that Spears tried to untangle the winch cable and may have been struck in the head by a crowbar that he appeared to have been using since he was later found with a contusion on his forehead. After working on the tangled winch cable, Spears apparently made his way about seven feet to the edge of the dredge and fell into the pond, even though hand rails were provided at the left side of the dredge where investigators believe he fell.

Spears was wearing blue jeans, t-shirt, and pull-on steel-toed boots but not a life jacket. His head injury may have rendered him unconscious since the pond scum on the side of the dredge was undisturbed, indicating that Spears did not attempt to climb out of the water. Without hand holds or an access ladder on the side of the dredge, Spears would have had difficulty pulling himself up nearly two feet to get out of the water. Reportedly, Spears could swim.

When Spears did not report to shore for shift change, about 4:00 p.m., co-workers searched for him. They immediately found one of his boots floating near the shore and the shore boat could be seen still tied to the dredge. An emergency boat was taken to the dredge, the engines were shut off, and Spears was found near the water jet spray intake at the rear of the dredge about 4:30 p.m. Efforts to resuscitate Spears were unsuccessful and he was pronounced dead at the scene by the coroner of St. Helena Parish. Death was attributed to drowning.

INVESTIGATION OF ACCIDENT

On the day of the accident, MSHA was notified at 4:39 p.m., by a telephone call from Eric Buchanan, plant manager, to MSHA's emergency hotline. Edward Lopez, district manager, was called and an investigation was started the same day. An order was issued pursuant to section 103(k) of the Mine Act to ensure the safety of miners. MSHA's accident investigation team traveled to the mine, made 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 and employees.

DISCUSSION

Location of Accident

The accident occurred on No. 10 dredge which was facing generally east in about 60 feet of water and about 75 feet from the nearest bank. Weather conditions at the time of the accident consisted of mostly cloudy skies, temperatures that reached 82 degrees Fahrenheit, and winds generally from the southeast around 15 mph with gusts up to 24 mph. Investigators believe that Spears' body drifted from the left side of the dredge to the rear of the dredge due to the wind and/or water movement in that general direction.

No. 10 Dredge

The dredge was constructed on site several years ago. It was about 60 feet long, 27 feet wide, and was equipped with an enclosed control booth, a water jet spray, 12-inch suction head, 10-inch slurry pump, one smaller water pump, and an on-deck cable winch. The dredge had two diesel engines, one to power the 10-inch slurry pump and one for all other power needs including the small water pump. The two diesel engines and the two pumps were operating when employees arrived at the scene.

The dredge was kept stationary in the pond by two ropes attached to on-shore anchors. The ropes could be adjusted to allow the dredge to move one direction or another. The small water pump picked up water near the rear of the dredge and directed it to the water jet spray through a water line. Sand and gravel in the pond were stirred up by the water jet spray, drawn into the nearby suction head and suction line then pumped to shore through approximately 1200 feet of pipeline.

The water jet spray with its associated water line and the suction head with its associated suction line were lowered or raised together in the dredge pond by the on-deck cable winch. The total suspended weight was estimated to be about 12,000 pounds.

The dredge deck was equipped with handrails made of various materials, including steel rods and cables. The section of handrail nearest the accident scene consisted of a 3/4-inch steel rod positioned 38 inches above the dredge deck but it was bowed near the middle. At the same location, there was also a 3/16-inch steel cable mid-rail mounted 17 inches above the dredge deck. Both were approximately 15 feet long. The handrail was

welded to vertical sections of pipe at each end and the mid-rail was secured at each end by cable clips.

There were no hand holds or access ladders on the side of the dredge to accommodate persons that might fall into the dredge pond. The dredge operators accessed the dredge deck by stepping from the shore boat through an opening in the hand rails at the rear of the dredge.

Dredging Process

Sand and gravel were dredged by lowering the water jet spray and suction head in the pond and moving them along the bottom. Occasionally, mud seams were encountered and made dredging difficult. The water jet spray and suction head were repeatedly raised and lowered to "punch through" the mud seams to reach more sand and gravel. While lowering the water jet spray and suction head into the mud, the dredge operators would sometimes feed the winch cable faster than the suction head could move. That would cause the winch cable to slacken and tangle on the reel, creating a condition commonly referred to as a "bird's nest". On average, this condition occurred a couple of times per month.

Winch

The on-deck winch was a Tulsa Winch model #23-SLLRFO that was installed about three years ago. It was spooled with approximately 250 feet of 3/4-inch 6X25 IMP winch cable. The winch had a 3-position, self-centering hand control that operated the screw which powered the winch reel either clockwise or counterclockwise. It was not equipped with a self-spooling feature to ensure proper spooling of the cable.

The hand control required operator presence in the control booth to either feed or spool the cable. When the hand control was centered, the screw would hold the winch reel stationary. By feeding the cable from the winch reel, the dredge operator could allow the suction head, water jet spray, and associated lines to descend under their own weight. By spooling the cable, the dredge operator could raise the suction head, water jet spray, and associated lines.

The winch was tested and no defects were found.

Cable Misalignment Correction Procedure

Prior to the accident, no written procedures were in place for persons to untangle a winch cable. However, the informal procedure used by dredge operators was to pull all the cable off the winch reel and rewind it with the assistance of another person.

Personal Flotation Device

A Type V (work vest) personal floatation device that had been issued to Spears was found on a chair just behind the control booth on the dredge. It was not designed to upright an unconscious person.

Training and Experience
Robert Spears had 16 years mining experience, and had operated a dredge for ten years. He worked at this operation for four weeks and had received training in accordance with 30 CFR, Part 46.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following root causes were identified:

Root Cause: Management policies and work procedures failed to address working alone on the dredge deck while performing potentially hazardous duties.

Corrective Action: Management should perform a risk assessment to identify those hazardous duties that require the presence and assistance of a second person. Policies should be established to ensure that employees follow safe work procedures.

Root Cause: Management policies and work procedures failed to identify the hazard of falling into water while working inside the hand rails that were provided around the perimeter of the dredge deck.

Corrective Action: Management should perform a risk assessment to identify and mitigate all hazards associated with the tasks to be performed. Dredge operators should wear a life jacket while working on the dredge deck.

CONCLUSION

The accident occurred because management policies and work procedures failed to adequately address the risks associated with working on water. Company policy did not require employees to wear a life jacket while working inside the hand rails provided around the perimeter of the dredge deck. The company did not have a policy or formal procedure relative to working alone on the dredge deck.

Additional considerations that might prevent future accidents include more substantial hand rails on dredges to keep persons from falling into the water, providing hand holds and access ladders on the sides of dredges in case someone needs to climb out of the water, and providing life jackets that will upright an unconscious person after they have fallen into the water.

ENFORCEMENT ACTIONS

ORDER No. 6251711 was issued on March 30, 2007, under the provisions of Section 103(k) of the Mine Act:

A fatal accident occurred at this operation on March 30, 2007, when a dredge operator was found floating in the water at the back of the dredge. This order is issued to assure the safety of all persons at this operation. It prohibits all activity on the number 10 dredge boat until MSHA has determined that it is safe to resume normal operations. The mine operator shall obtain approval from an authorized representative for all actions to recover and/or restore operations to the affected area.

This order was terminated on April 3, 2007, after conditions that contributed to the accident no longer existed.

CITATION No. 6261415 was issued on April 17, 2007, under provisions of Section 104(a) of the Mine Act for violation of 30 CFR 56.15020.

A fatal accident occurred at this operation on March 30, 2007, when a dredge operator drowned. He was not wearing a life jacket or belt where there was a danger of falling into water.

The citation was terminated on April 17, 2007, after the mine operator revised the standard operating procedures to require that persons wear personal floatation devices at all places where there is a hazard of falling in the water.

Approved:_____ Date:_____

Edward E. Lopez
District Manager

APPENDIX A

Persons Participating in the Investigation

Martin Marietta Materials, Inc.

Eric Buchanan	plant manager
John Byars	manager health/safety and employee relations
Donald Taggart	safety/ human resources representative
Gene Whelan	district production manager

Mine Safety and Health Administration

Brian P. Goepfert	supervisory mine safety and health inspector
Willard J. Graham	supervisory mine safety and health inspector

Appendix B

Accident Investigation Data - Victim Information
Event Number: 1 0 2 7 3 7 6

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. Last Four Digits of SSN:	5. Degree of Injury:
Robert Spears	M	34		01 Fatal

6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: a. Date: 03/30/2007 b.Time: 16:00

7. Date and Time Started: a. Date: 03/30/2007 b.Time: 4:00

8. Regular Job Title: 172 Dredge operator

9. Work Activity when Injured: 098 Freeing a deck mounted winch

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

11. Experience	Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days		Years	Weeks	Days
a. This Work Activity:	10	0	0	b. Regular Job Title:	10	0	0	c: This Mine:	0	4	0	d. Total Mining:	16	0	0

12. What Directly Inflicted Injury or Illness? 048 Crowbar

13. Nature of Injury or Illness: 110 Drowning

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

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

Independent Contractor ID: (if applicable)

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

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

18. Union Affiliation of Victim: 9999 None (No Union Affiliation)

Victim Information:

1. Name of Injured/Ill Employee:	2. Sex	3. Victim's Age	4. Last Four Digits of SSN:	5. Degree of Injury:

6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:

7. Date and Time Started

8. Regular Job Title:

9. Work Activity when Injured:

10. Was this work activity part of regular job? Yes | | No | |

11. Experience:	Years	Weeks	Days		Years	Weeks	Days		Years	Week	Days		Years	Weeks	Days
a. This Work Activity:				b. Regular Job Title:				c: This Mine:				d. Total Mining:			

12. What Directly Inflicted Injury or Illness?

13.Nature of Injury or Illness:

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

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

Independent Contractor ID: (if applicable)

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

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

18. Union Affiliation of Victim:

Victim Information:

1. Name of Injured/Ill Employee:	2. Sex	3. Victim's Age	4. Last Four Digits of SSN:	5. Degree of Injury:

6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:

7. Date and Time Started:

8. Regular Job Title:

9. Work Activity when Injured:

10. Was this work activity part of regular job? Yes | | No | |

11. Experience:	Years	Weeks	Days		Years	Weeks	Days		Years	Week	Days		Years	Weeks	Days
a. This Work Activity:				b. Regular Job Title:				c: This Mine:				d. Total Mining:			

12. What Directly Inflicted Injury or Illness?

13. Nature of Injury or Illness:

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

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

Independent Contractor ID: (if applicable)

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

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

18. Union Affiliation of Victim: